

Scrolling Sign

Technical Manual

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GSM Monitor

For eShow Signs

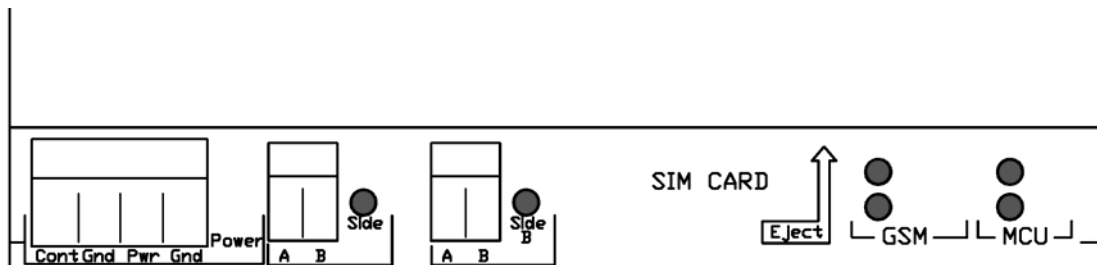
Introduction

GSM Monitor for eShow Signs is designed to monitor and report the operating status of eShow Scrolling signs via SMS (Short Message Service) of GSM cellular network.

A GSM Monitor services up to two eShow scrolling systems, i.e. a double-sided eShow scrolling sign requires only one GSM Monitor.

Installation

The GSM Monitor can be installed inside eShow scrolling sign. The wiring is as follows.



Power control (Cont and Gnd)	connected to the main power of the Scrolling system, e.g. the 24V DC for ULSPDE.
Power (Pwr and Gnd)	power supply of the GSM Monitor. Typically connected to the battery of the POPS (Power Off Post Settling) is POPS is fitted.
Side A connector:	connected to synchronisation port of the scrolling system.
Side B connector:	connected to synchronisation port of the other scrolling system in a double-sided sign.
Side A indicator:	status indicator of the scrolling system.
Side B indicator:	status indicator of the other scrolling system in a double-sided sign.
SIM CARD slot:	slot with a SIM card holder for installing the GSM SIM card.
Eject button:	push to eject the SIM card holder.
GSM indicators:	indicators for the GSM network connection
MCU indicators:	operation status of the GSM Monitor

The GSM Monitor is shipped with an antenna with an elbow SMA connector. The antenna socket is wired from the GSM monitor box, and recommended to be fitted on side of the scrolling sign. Please install the antenna before using the GSM Monitor.

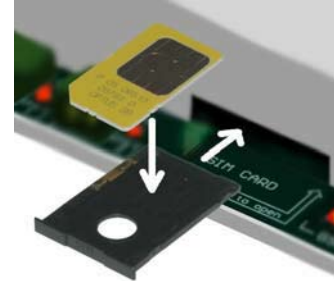


Installing SIM card

GSM Monitor requires a GSM SIM card to operate. Before installing the SIM card, please test it on a GSM cellular phone and make sure the SIM card is activated, SMS-enabled and not PIN protected.

To install the SIM card:

- Turn off the GSM Monitor;
- Press Eject button to take out the SIM card holder;
- Place the SIM card on the holder;
- Push the holder fully back in the original position.



Testing the GSM Monitor

After installing the SIM card, turn on the GSM Monitor. The red GSM indicator will be on and the green one blinking. This should last approximately 10 to 15 seconds before the red indicator goes off and the green one starts blinking at a 3 second interval.

If the red indicator stays on, it means the GSM Monitor is not successfully connected to the cellular network. Please make sure:

- Cellular network is available and the SIM card is activated;
- The antenna is properly installed.

Programming the GSM Monitor

The GSM Monitor can be programmed via SMS. Simply use a cellular phone to send command(s) followed by parameters to the GSM Monitor.

Command	Descriptions	Parameter and restriction
Base	Set the dialing number	Phone number of 6 to 15 digits. No other characters or space.
ID	Set the sign identifier	ID comprising 4 to 15 alphanumeric (letters or number) characters. No symbols, punctuation marks or space.
Mode	Set the reporting mode	0 to 7
Report	Request status report	Parameter not required

Multiple commands delimited by space, comma or semicolon can be sent in one single text message. Both upper and lower cases are acceptable.

Examples:

1. Single command

```
Base 87654321
```

2. Multiple command

```
ID BDXSign01;  
Base 87654321;  
Mode 2;  
Report
```

3. Invalid command

```
ID A-001
```

The GSM Monitor will send back a text message to every received text message as acknowledgement.

Examples:

1.

```
*SPDE001*  
is turned on.  
Current mode=2  
Status=Side  
A:OK / Side  
B:OK
```

2.

```
*SPDE001*  
Status=Side  
A:OK / Side  
B:OK
```

3.

```
*SPDE001*  
is turned off.
```

Reporting mode

GSM Monitor supports 7 reporting modes:

Mode	Report triggers
0	User request
1	User request, scrolling system error and recovery from error
2	Same as 1, plus, power turned on, power turned off
3	Same as mode 2, plus lapse of every 1 hour
4	Same as mode 2, plus lapse of every 2 hours
5	Same as mode 2, plus lapse of every 4 hours
6	Same as mode 2, plus lapse of every 8 hours

* Power off reporting only possible when POPS (Power Off Poster Settling) option is fitted.

Report examples:

1.

```
*Unnamed unit*  
New Dialing  
No.  
=87654321
```

2.

```
*Unnamed unit*  
New ID  
=BDXSign001  
New dialing  
No.  
=87654321  
New mode=2  
Status=Side  
A:OK / Side  
B:OK
```

3.

```
*BDXSign001*  
Invalid new ID
```

Indicators

MCU indicators

Conditions	Red	Green
Starting up ^{Note}	Flashes every 2 seconds for 20 seconds	Flashes briefly every second
Standing by	Off	Flashed briefly every second
Transceiving	On for up to 2 seconds	Flashed briefly every second
Shutting down	Flashes rapidly for 5 seconds	Flashed briefly every second
Fatal error	Flashes alternately with the green one	Flashes alternately with the red one

Note: If the red indicator stays on when starting up, it is indicated that dialing number has not been set up yet. Automatic reporting will not work until valid dialing number is set by the “Base” command.

GSM indicators

Conditions	Red	Green
Searching for network	On	Flashes every second
Standing by	Off	Flashed briefly every 3 seconds
Transceiving	On for up to 3 seconds	Flashed briefly every 3 seconds
Error	On	Off

Side A / Side B indicator

Conditions	Indicator
Starting up	Flashes every 2 seconds for 5 seconds
Scrolling system normal	Flashed briefly every second
Scrolling system error	On

Status Report

Message	Descriptions
OK	The scrolling system is operating normally.
OK7	The scrolling system is in set-up mode or manual scrolling mode.
Error0	The scrolling system has stopped due to problem with the scroll end sensors.
Error1	The scrolling system has stopped due to problem with both upper and lower rollers.
Error2	The scrolling system has stopped due to problem with the upper rollers.
Error3	The scrolling system has stopped due to problem with the lower rollers.
Error4	The scrolling system has stopped due to unidentified movement problem.
Error5	Fatal error inside the GSM Monitor.
Off	The scrolling system is not operating.
Unknown	Unidentifiable conditions.

For further information and support, please contact

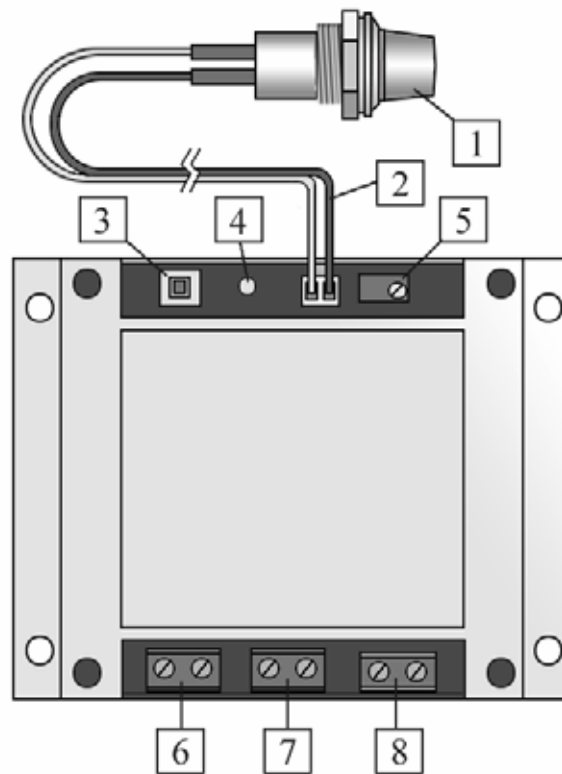
www.eshow.ca

Photo Sensing Switch

For Lighting Control of eShow Signs

eShow Photo Sensing Switch is designed to switch the internal illumination on or off according to the ambient lighting condition.

A photo sensing switch has two output channels, each of which can control up to 5A.



1. Photo Sensor (to be mounted externally)
2. Photo Sensor Lead
3. Mode/Test Switch (Automatic when pressed down; Always on when released)
4. Power Indicator
5. Sensitivity adjustment
6. Power Out (channel 1, 5A max.)
7. Power Out (channel 2, 5A max.)
8. Power In (200V - 240V AC, 10A max.)

Scroll - a - Sound

User' s Guide

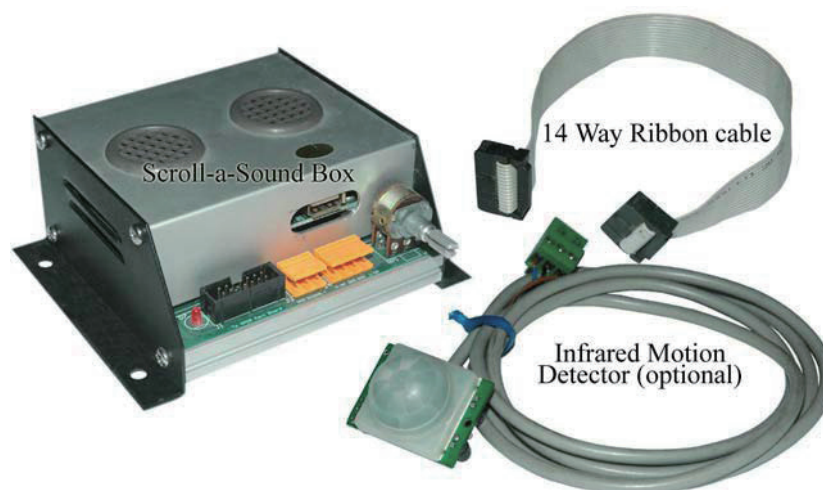
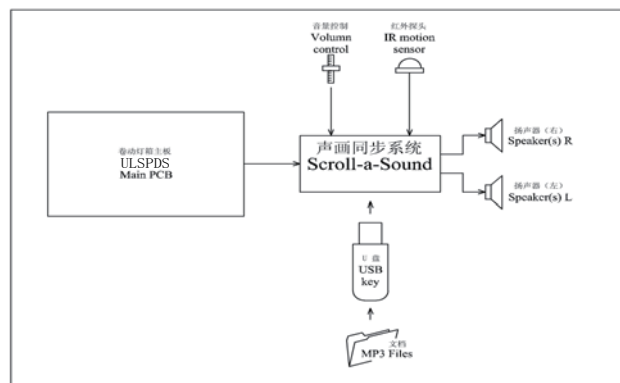
Thank you for purchasing **Scroll-a-Sound**. Please read this User's Guide carefully prior to installation.

I. Introduction

Scroll-a-Sound is designed to work in conjunction with eShow scrolling signs. It automatically playbacks soundtracks corresponding to the posters. **Scroll-a-Sound** effectively enhances the awareness and impact of your advertisements.

Scroll-a-Sound features:

- Automatic synchronisation of poster and sound
- CD quality stereo playback
- Built-in amplifier
- USB interface and MP3 compatible
- Optional infrared motion activator



II. Hardware Installation

Scroll-a-Sound is directly compatible with all current eShow scrolling systems and early systems of version C or later (e.g. ULSPD-51C). Some early scrolling systems might require firmware upgrade. Please see Appendix A or contact our technical support should there be any question.

1. Install the **Scroll-a-Sound** box near the scrolling system main controller. Connect the **Scroll-a-Sound** box to the scrolling system main controller with the 14 way ribbon cable.
2. Install the speaker boxes on the sides of the scrolling sign or other appropriate position, then connect them to the **Scroll-a-Sound** box.
3. Install the infrared motion detector to an appropriate position and connect it to the **Scroll-a-Sound** box.
4. Tidy up all the cables.



III. Soundtrack Preparation

1. Prepare all soundtracks in MP3 format.
2. Create a folder named “ADVERT01” in the root directory of a USB key.
3. Copy all MP3 files into the “ADVERT01” folder. All files should be named with the corresponding poster numbers, e.g. 1.MP3, 2.MP3 and so on. (The first poster from the top of a scroll is poster 1; **Scroll-a-Sound** supports up to 15 soundtracks).

IV. Operation

After all hardware parts are properly installed and connected, plug the USB key into the **Scroll-a-Sound**, and turn on the scrolling sign. The power indicator on the **Scroll-a-Sound** should turn on.

When powered on, **Scroll-a-Sound** might not start working immediately until it comes to display the poster 1.

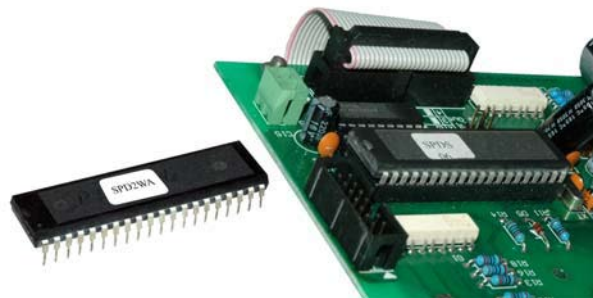
The playback volume may be adjusted by using the volume control knob on the **Scroll-a-Sound** box.

The playback of a soundtrack starts as soon as the scrolling sign stops at the corresponding poster and will continue while the sign is scrolling for the next poster. However, a soundtrack will be played back once only and not be repeated. Please adjust the display timing on the scrolling sign so that it matches the lengths of the soundtracks.

If an infrared motion activator is fitted, playback will be immediately activated when ambient motion is detected, and stop if no ambient motion is detected in approximately 15 seconds.

Appendix A. Use Scroll-a-Sound with some early eShow signs

Some early eShow scrolling systems might require firmware upgrade. If this is the case, a new MCU (an IC) will be provided. Please replace the original MCU with the new one.

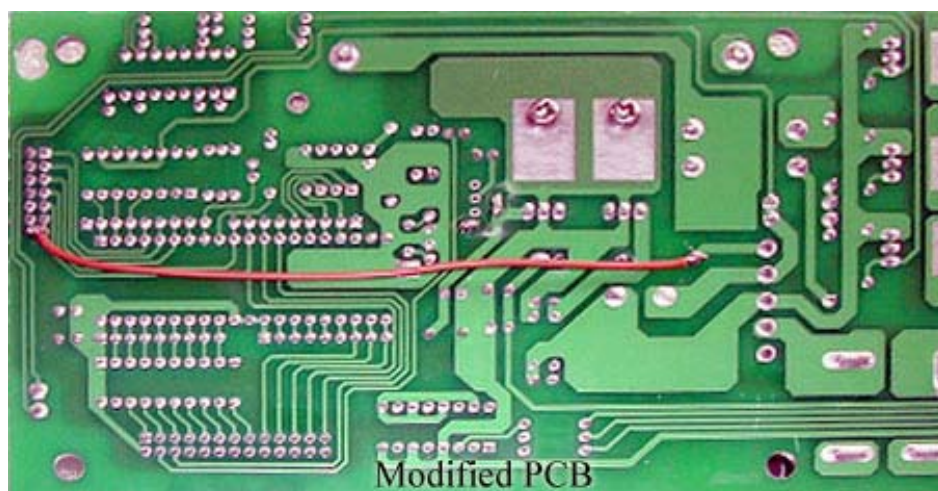


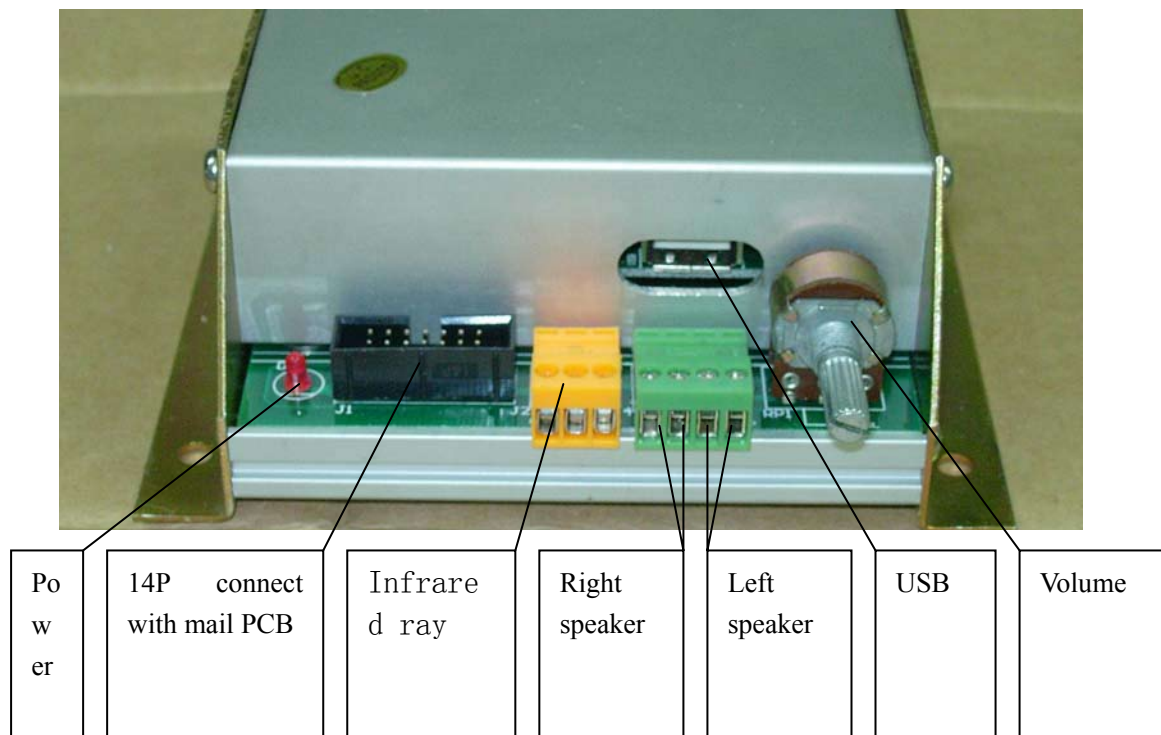
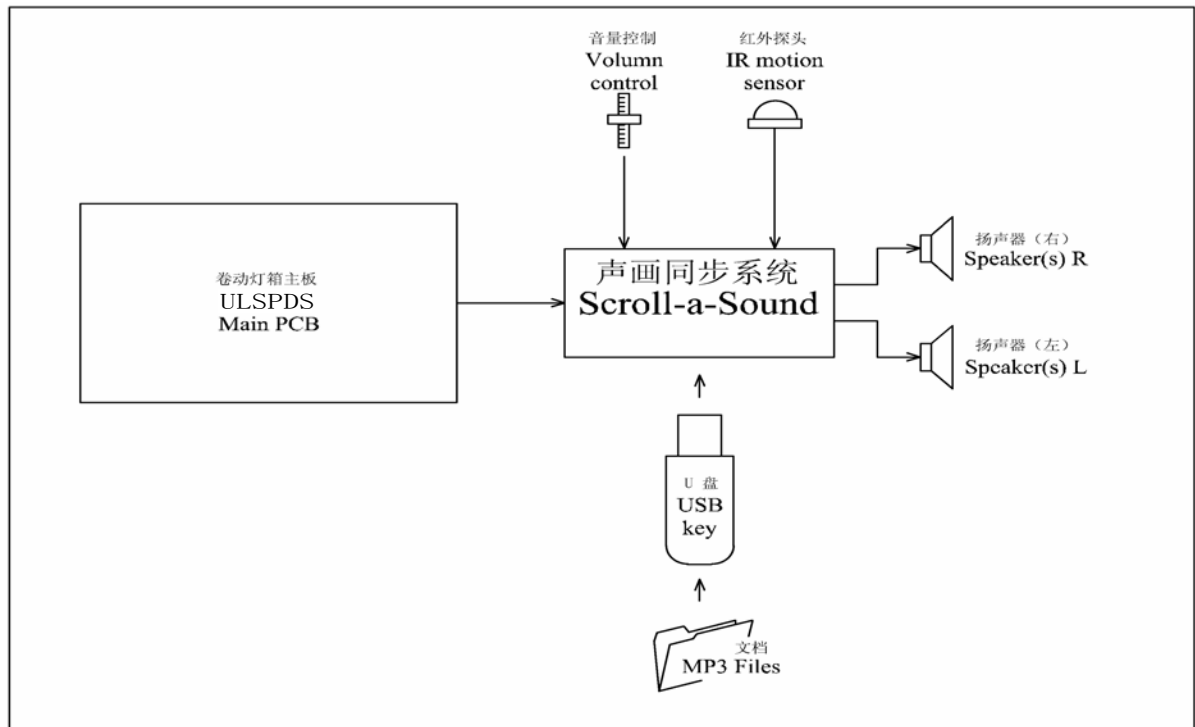
Some ULSPD-51C PCBs (printed circuit boards) in early eShow scrolling signs require modification on the main PCB (printed circuit board) to support **Scroll-a-Sound**. Simply solder a wire on the back of the PCB as shown on Fig. 5.

Modification required



Modification NOT required





Scrolling Poster Display Array

(ULSPDA)

User's manual

May 2007

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Important Information

Thank you for purchasing ULSPDA (Scrolling Poster Display Array) , please read this manual carefully before installation.

Disclaimer

While every effort has been made to ensure that the information contained in this user's manual is accurate and up-to-date, no liability for error or omission will be accepted. Beidouxing Science and Technology Development Co. Ltd. reserves the right to change the functions, features and specifications of its products at any time without prior notice.

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ULSPDE, Scrolling Poster Display Engine, ULSPDS, Scrolling Poster Display System, Scroll-a-Sound, POPS (Power Off Poster Settling) are trademarks of Beidouxing Science and Technology Development Co. Ltd.

Safety Notes

To ensure continued safe operation of the product, please read the following safety notes carefully. Please contact Beidouxing Science and Technology Development Co. Ltd. should you have any question or require additional information concerning product safety.

Electricity safety

- The product should be assembled and installed by qualified electrician.
- Power source for the product must matches the product specifications; power outlet must be properly grounded. Earth leakage circuit breaker is highly recommended.
- Disconnect the main power supply if any of the following occurs:
 - Unusual noise or odour is noticed
 - Any electrical cable is damaged
 - Any internal component has been exposed to water or other liquid
 - Any component appears physically damaged

Operational safety

- Follow all warnings and instructions marked on or supplied with the product.
- Note that the standard framework for ULSPDA is designed to hold the ULSPDA units and provide working platforms for installation and maintenance, but not designed to sustain wind loading and other additional forces. Therefore, the framework must be secured to structure with adequate strength and stability.
- It is strongly recommended that the hardware installation of ULSPDA is planned and supervised by a structural engineer.
- Make sure that ambient operation temperature for the product is in range -15°C to 45°C, humidity 20% to 85%.

I. About ULSPDA

ULSPDA, or Scrolling Poster Display Array is designed to meet the global demand for ultra large outdoor multi-display. It is a product of our years of expertise, experience and innovation in sign industry. Consisting of an integrated controller and a number of scrolling display units, an ULSPDA is capable of making over 1,000 square metres of multi-image advertising spectacle.

ULSPDA features:

- Sizeable multi-display of up to over 1,000 square metres
- Up to six sets of images per array
- Great image integrity with gaps between posters in adjacent scrolling units being only 5cm
- Patented digitally controlled scrolling engines for excellent reliability
- Sophisticated control system and proprietary software for unlimited combinations of sequences and timings
- Elaborately designed aluminium casing
- Complete weatherproof design
- Very competitive prices

Each ULSPDA consists of three key parts:

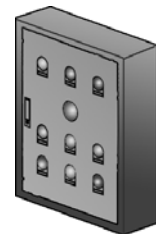
▪ Scrolling display units

All scrolling display units are of identical specifications, including size. Each of them holds its own poster scroll, which can carry up to 6 images. Each unit in a ULSPDA can be assigned a unique address so that it can be controlled independently by the integrated controller through a communication port.



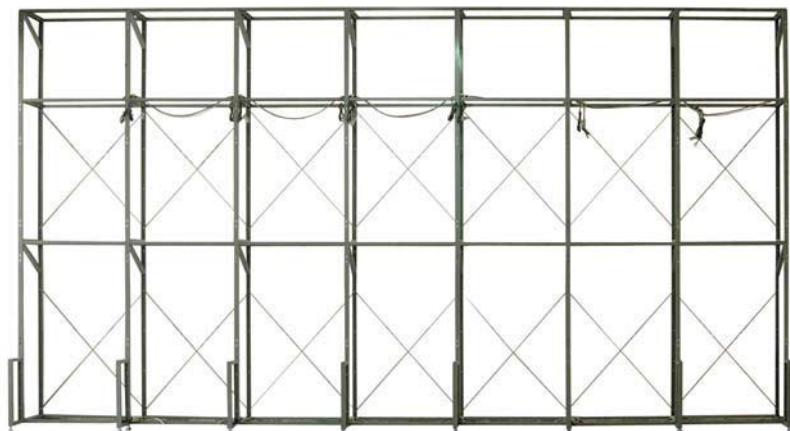
▪ Integrated controller

The integrated controller controls the scrolling movement and the power supply of all scrolling display units. It comprises a controller unit and a group of circuit breakers, timer, contactors, relays etc. the controller unit has four communication ports for connecting virtually unlimited number of scrolling display units. The integrated controller has 14 built-in display patterns, while custom patterns can be designed on and up-loaded from PC.



▪ ULSPDA Rack

This ULSPDA rack is designed to hold all scrolling display units and provide working platforms for installation and maintenance. It can be built by customers according to our specifications.



II. ULSPDA Scrolling Display Unit

Overview

ULSPDA scrolling display unit is similar to stand-alone scrolling poster display system. The size of the units is standardised to 1.22M x 1.22 M (4' x 4'). The unit has a back cover that can be opened. Optional back light components (if fitted) are built on the inside of the back cover.

The scrolling poster movement in the unit is controlled by external control signal, while operation as a stand-alone unit is also possible in a special mode.

Key Components

Casing

The casing of the ULSPDA scroller unit is build of extruded aluminium. The casing has a transparent front and a back cover, which is fixed by four screws and can be removed for servicing the unit.

There are four doors on the back panel. These doors work as vents for the units; they can be opened for accessing to connectors and switches without removing the whole back cover.

The back cover also optionally holds the back light components.

Every ULSPDA scroller unit is shipped with four mounting angles, which are for securing the unit to the mainframe.



Front



Back panel with Lights



Back

Rollers

There are four rollers in each scroller unit, two main rollers fitted with built-in motor, sensors etc.; the other two smaller rollers are idlers.

The rollers are made of aluminium. Lines are can be found on the surface of the main roller for poster alignment.

On a main roller, there is a hole on the surface near the left-hand side (when viewed from the back); sticking out from the hole is a small plastic finger that can be pressed flush by wound-up poster.



Unit controller

This is the brain of the scroller unit. It controls all aspects of the scrolling movement and timing.

Unit controller has a series of connectors for power supply, rollers, communication etc. it also has two DIP switches for setting the number of images and unit address, respectively.



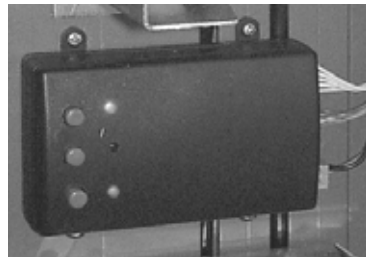
ULSPAS

ULSPAS (scrolling poster alignment system) is designed to ensure continued operation without seeing the poster shifting horizontally to either side. It comprises an actuator assembly, a poster sensor and a ULSPAS box.

The poster sensor picks up the poster position and sent to the ULSPAS box. There's a slot in which the poster should go through.

The ULSPAS box is the microprocessor-based circuitry that processes the signal from the sensor, and drive the actuator.

The actuator assembly is connected to one end of the upper idling roller. It effects slight tilting movement of the roller and so as to rectify the poster's horizontal shifting during the scrolling.



Power supply

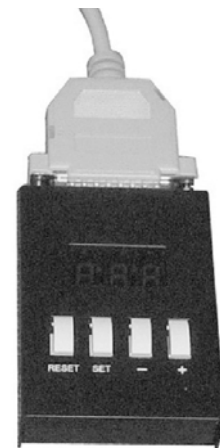
This is a switch mode power supply for the scrolling movement. Please note that it doesn't power the back light.

Back light (optional)

Back-light in the unit, if this option taken, is four 30W/T8 lamps driven by two electronic ballasts. All back light components are fitted on the inside of the back cover.

Handheld programmer

This handheld programmer provides a user interface for the scroller unit.



Hardware Installation

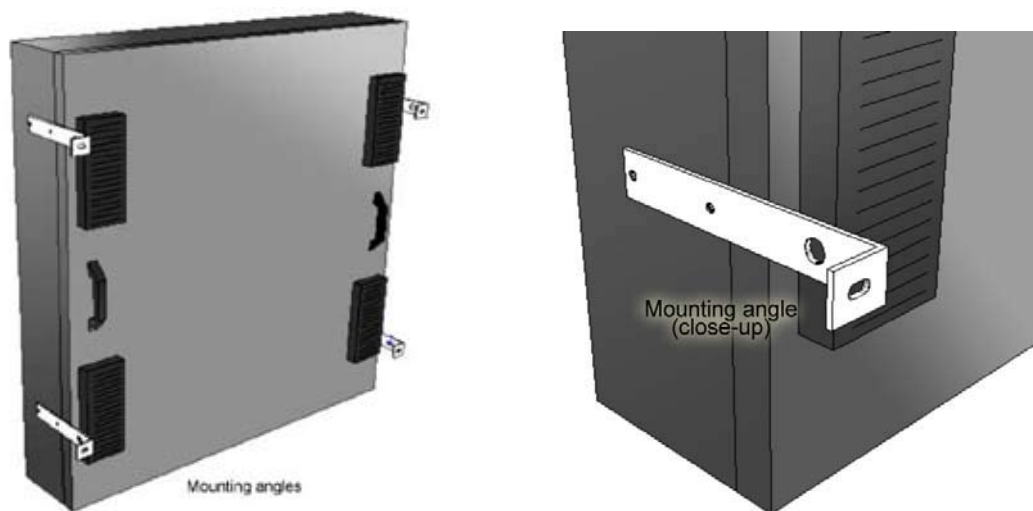
Before installing the scroller units, the ULSPDA framework needs to be constructed, and the mounting angles should be fixed to the units.

For details of ULSPDA framework construction, please contact our engineering department.

Holes are already prepared on the left and right of the casing of the scroller unit for the mounting angles. Open the back cover first, and use the supplied bolts and nuts to fix the mounting angles on the casing.

Please note that the short sides of the mounting angles should all be pointing to the right hand side of the scroller unit (when viewed from the front).

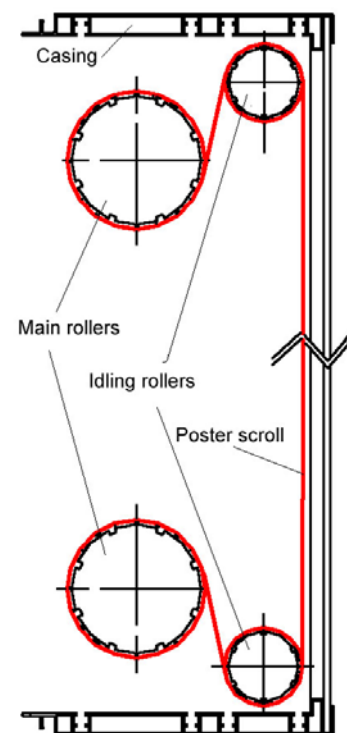
When installing the scroller units on the framework, make sure that all units are straight, level and evenly spaced.



Poster Installation

Poster installation is required for each scroller unit and is to be carried out from the back of the unit.

1. Turn off the power and disconnect all power cords and communication cables from the scroller unit.
2. Open the back cover.
3. Remove the old poster scroll if applicable.
4. Run upper end of the poster scroll through the path and align it to the lower line of the upper main roller.
5. Make sure the poster is horizontally centred and fix it on the upper main roller using adhesive tape. It is recommended to use a number of pieces, each of which about 10cm, instead of using one long piece
6. Manually wind the poster one revolution, check and make sure that the sensor hole on the poster scroll matches the hole on the main roller so that the sensor finger can pop out. If sensor hole on the poster scroll is not yet cut, cut the hole.
7. Turn the power on and set the unit in free scrolling mode (please refer to later section “Using the handheld programmer” on this manual for more information).
8. Set the ULSPAS in manual mode (please refer to later section “Using the ULSPAS” in this manual for more information).
9. Wind the poster scroll up on the upper main scroller using the free scrolling function.
10. Turn off the power.
11. Repeat 4 steps 4 – 9 to fix the lower end of the poster scroll to the lower main roller.
12. Turn the power back on set the unit in free scrolling mode again.
13. Use the free scrolling mode to scroll the poster fully up and fully down a few times, make sure the poster scrolls smoothly, unbiasedly and free of wrinkles. If the poster tends to shift horizontally to either side, reinstall the poster scroll or make adjustment with the ULSPAS manual mode.
14. Check and make sure the poster run through the slot of the ULSPAS sensor before set the ULSPAS back to automatic mode.



15. Reconnect all power and communication cables, close the back cover and restart the scroller unit.

Configuration and Test Run

Setting Unit ID (address) and number of images

DIP switches

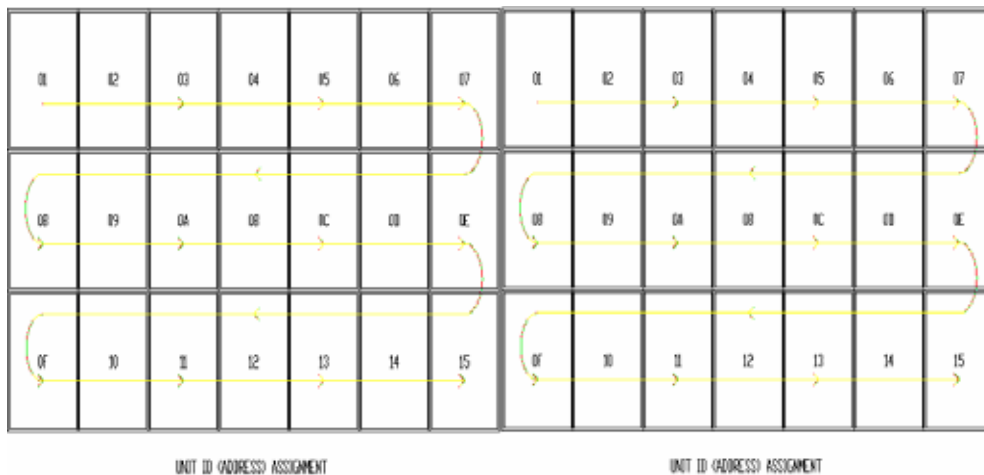
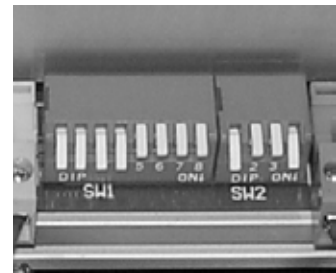
On early ULSPDA scrolling display units, there are two DIP switches on the unit controller. The 4-bit switch is for setting the number of images on the poster scroll; the 8-bit switch is for setting the unit ID (address) number.

On new ULSPDA scrolling display units, the settings are done in function 1 (F-1) with the programmer.

Either way, the settings can be read in function 1 (F-1) with the programmer.

Unit ID number assignment should start from 1, and from upper left to right. The maximum number allowed is F0 (250). If a ULSPDA has more than 250 scroller units, two or more units may share an ID number.

Both settings are in binary format. Please refer to *Appendix C. Decimal-Hexadecimal-DIP Switch Setting* for details.



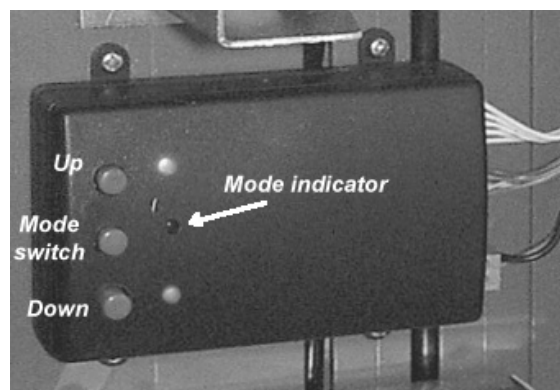
Using the ULSPAS

ULSPAS has two working modes: automatic and manual, switchable by using the Mode button. There are three indicators on the ULSPAS box, when the middle one is on, it indicates that ULSPAS is in manual mode; when that indicator is off, it means ULSPAS is in automatic mode.

The Manual mode allows user to tilt the roller by pressing the up or down button on the ULSPAS box.

When the poster shifts, or tends to shift horizontally to one side when scrolling, it is necessary to use the manual mode of ULSPAS to make rectification.

When the poster shifts to the ULSPAS side, tilt the roller up; if the poster shift to the opposite side, tilt the roller down.



After using ULSPAS in manual mode, do not forget to switch it back to automatic mode.

When ULSPAS is in automatic mode, it automatically tilts the roller according to the signals picked up by the sensor. It does not respond to the down buttons have no effect.

Using the handheld programmer

When the scroller unit runs in normal mode, the handheld programmer can be plugged in and used to monitor the status of the unit. When the unit is displaying a image, the high digit of the LED shows the number of the image and the other two digit shows the time in second, for which the image has been displayed for. When the unit is scrolling, the programmer shows three hyphens, also scrolling.

The [Reset] button on the programmer can be pressed to restart the scroller unit.

In special mode, the handheld programmer has more functions. To enter the special mode, press the [Reset] button or simply turn on the power with both the [-] and [+] buttons held down.

The special mode starts with a function menu. Function can be changed by pressing the [-] or [+] button, and selected by pressing the [Set] button. The functions are detailed in the following table.

LED display	Function
F-1	<p>Set up</p> <p>On early ULSPDA scrolling display units, this function only to show the current settings of number of images and unit ID (address). Changes can be made on the DIP switches at the same time.</p> <p>On new scrolling display units, changes can be made by using the [-] and [+] buttons.</p> <p>Axx: Unit ID (address, 01-FE)</p> <p>Pxx: Number of Images (1-15)</p> <p>Press the [Set] button to go through the settings.</p>
F-2	<p>Free Scrolling</p> <p>This function allows user to scroll poster up or down by pressing the [+] or [-] button. This is particularly useful for loading and checking poster. It is also useful for troubleshooting.</p> <p>While scrolling the poster, the LED on the programmer will show scrolling hyphens, which will otherwise be still.</p>
F-3	<p>When this function is selected, the scroller unit will operate as a stand-alone unit. Control signal from the communication port will be ignored.</p> <p>Please note that the scroller unit will go back to normal mode when restarted.</p>
F-4	Reserved diagnostics for internal components
F-5	Reversed diagnostics for communication

Maintenance

For continued reliable operation of ULSPDA , it is recommended that the following inspections/maintenance be carried out regularly.

- Check the moving components for loosing parts, unusual noise and wear and tear.
- Check the poster for damage, deformation and shifting.
- Check the sensors and make sure the scroll end sensor fingers can pop out of the main rollers and the poster run through the ULSPAS sensor slot.
- Check the electrical and electronic components for visible damage and overheating.
- Clear up, grease the bearings and fasten the screws if necessary.

III. ULSPDA Integrated Controller

Overview

ULSPDA integrated controller controls the power supply to all ULSPDA scroller units and coordinates the scrolling display of all scroller units.



Main components

Cabinet

Typically, ULSPDA integrated controller has a weatherproof cabinet to house all other components. There are a number of switches and indicators on the front door of the cabinet. Power and communication cables are connected through the underneath.

Central control unit

This micro controller based unit is the brain of the whole ULSPDA. LED display and the buttons provide a user interface for system programming.

Communication ports

There are four identical communication ports on the bottom of the cabinet for distributing control signals to the ULSPDA scroller units

Power terminals

A row of power terminals in the cabinet are for connecting incoming main power as well as power supply to all ULSPDA scroller units.

Circuit breakers and fuses

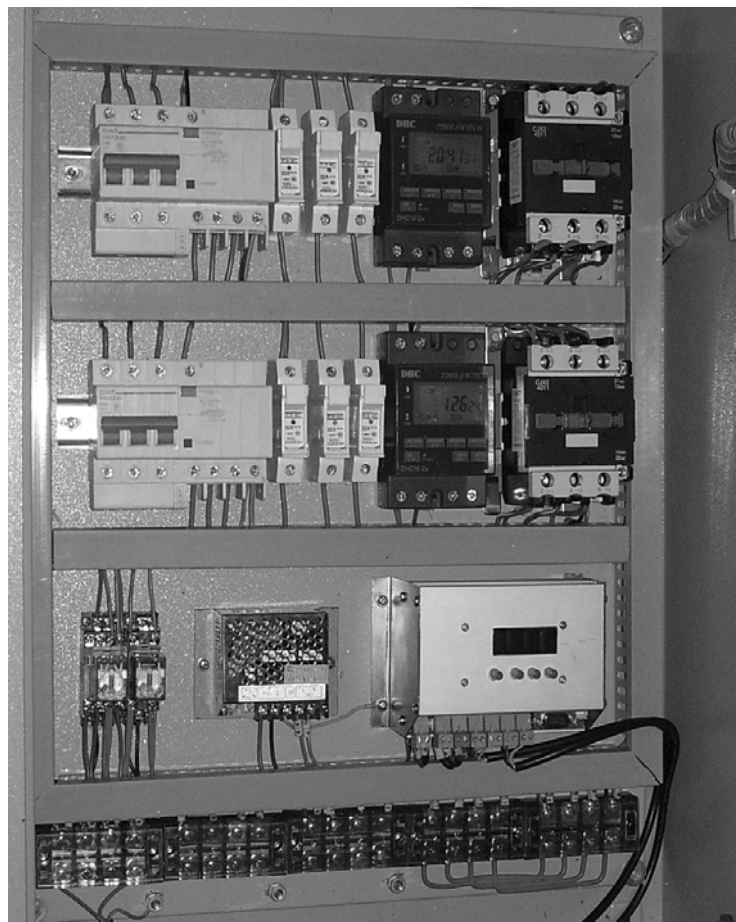
Both overload and earth leakage circuit breakers are fitted for safety purpose.

Timer switches

Two timer switches are fitted to control the on and off time for scrolling display and lighting respectively.

Contactors and relays

These contactors and relay(s) are controlled by the central control unit to switch the high voltage power circuits.



Connectivity

Power

Please refer to the labels in on the power terminals and connect the power cables accordingly. Note that this must be carried out by qualified electrician.

Communication

The four communication ports are all identical, ie the output from different ports are the same. The control signals in ULSPDA are relayed by each scroller unit and thus will not a ttenuate in transmission. Splitting the scroller units into branches and connect them to different ports of the integrated controller could be beneficial for cabling and troubleshooting.

ULSPDA is supplied with necessary communication cables. Use them to connect the integrated controller and the scroller units according to the schematic below.



Interface with PC

The central control unit has an RS-232 port for interfacing with PC for some advanced features. Please to *Appendix A Programming with PC* for more information.



Basic operation

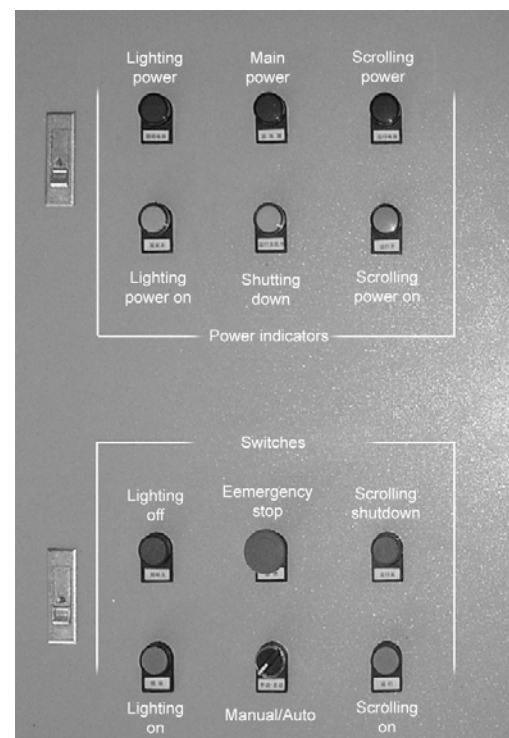
Operation modes

Two modes, auto and manual, are selectable for the integrated controller using the mode switch on the front door. In auto mode, the built-in timer switches control the on and off of the power; in manual mode, the timer switched is overridden by the on/off buttons on the front door.

Emergency stop

There is a red emergency switch on the front door of the integrated controller. Pushing down this switch will instantly switch off all power supply, regardless all settings and status.

To reset this emergency switch, rotate the red knob clockwise so that it pops out to the original position.



Turning the lighting on and off

To turn the lighting on or off in manual mode, simply use the button switches on the front door of the integrated controller.

Turning on and shutting down the scrolling display

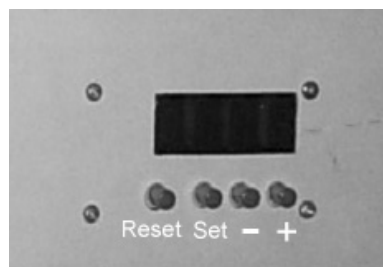
To turn on the scrolling display in manual mode, press the green “Scrolling On” button. This will turn on the power supply to the scrolling mechanisms of all units; the central control unit will then initialise all the units. This initialisation takes approximately 60 seconds and is to instruct all units to scroll all the way up and then all the way down so that they all start display from the first image.

To shut down the scrolling display, press the red “Scrolling Stop” button. Like starting up, this does not turn off all units instantly. Instead, all units will scroll all the way down and stop at the first image before the power shuts down. Shutdown process takes approximately 30 seconds, during which the “Shutting down” indicator is flashing.

System programming

ULSPDA integrated controller allows users to perform custom programming sing the central control unit.

Normally, the LED display on central control unit works as a monitor showing current operation status. User can also press the “Reset” button to restart the ULSPDA.



LED display	Status
P--X	Central control unit performing self-diagnosis. X is the diagnosis code.
E--X	Error, system is on halt. X is the error code.
X-YY	Normal, while X is the current number of image and Y is the time lapse in seconds.
H-XX	ULSPDA being initialised, XX is the number of second remaining.
P00F (flashing)	ULSPDA being shutdown

To enter set-up mode, press the “Reset” button with both [-] and [+] buttons held down.

The set-up mode starts with the main menu “F--1” on the LED display. Use the [-] or [+] button to change functions and press [Set] to select.

Menu item	Descriptions	
F--1	Set display pattern and other parameters. Please refer to next table for more information.	
F--2	Advanced command table view / edit	For service personnel only
F--3	Free instruction sending.	For service personnel only
F--4	PC download and upload. Please refer to <i>Appendix A Programming with PC</i> for more information.	
F--5	Format the internal memory.	For service personnel only
F--6	Communication port testing.	For service personnel only

When the first main menu item (set display and other parameters) is selected, the system enters a new menu where there are eight (8) items. Use the [-] or [+] button to decrease or increase the setting value and [Set] button to confirm and go to the next item. Changes will be saved when the last item is confirmed.

Please note that all settings are hexadecimal numbers.

Number	Set-up item	Value	Descriptions
1	Display pattern	0	Simple synchronisation
		1	From top to bottom
		2	From left to right
		3	From upper left to lower right
		4	From lower left to upper right
		5	Chess board
		6	From inner units to outer units
		7	From outer units to inner units
		8	From inner columns to outer columns
		9	From inner rows to outer rows
		A	From outer columns to inner columns
		B	From outer rows to inner rows
		C	From right to left
		D	From bottom to top
		E	Demonstration (mixed combination of all built-in patterns)
		F	Command table mode (run according to a command table that is designed and up-loaded from PC)
2	Number of scroller units	2 – FA	i.e. 2 to 250 units, default value: FA (250)
3	Number of rows	2 – FA	i.e. 2 to 250 rows, default value: A (10)
4	Number of columns	2 – FA	i.e. 2 to 250 columns, default value: A (10)
5	Number of command sets	1 – FF	i.e. 1 to 255, default value: 1 (automatically loaded, please do not change)
6	Number of images on the poster scroll	2 – F	i.e. 2 to 15 images, default value: 4
7	Global display duration (second)	1 – 3C	i.e. 1 to 60 seconds, default value: 5
8	Transition delay for built-in patterns (second)	1 - 3	i.e. 1 to 3 seconds, default value: 1

IV. Troubleshooting

Scroller unit troubleshooting

Symptom	Possible cause / remedy
ULSPDE is not working, no display on the programmer.	
Indicator on the power supply unit is not on.	Main power is not properly connected.
Indicator on the power supply unit is on but the indicator on the main control unit is not on.	Power not properly connected between the power supply unit and the main control unit.
Both power indicators are on.	Check the connection from the main control unit to the programmer.
Power indicators are on, the LED on the programmer shows ticking numbers but poster never scrolls	ULSPDE has been set as a slave unit (the master/slave plugged in).
ULSPDE seems to be working but doesn't stop at desired position.	The number of images is not correctly set. Refer to previous chapter for more information.

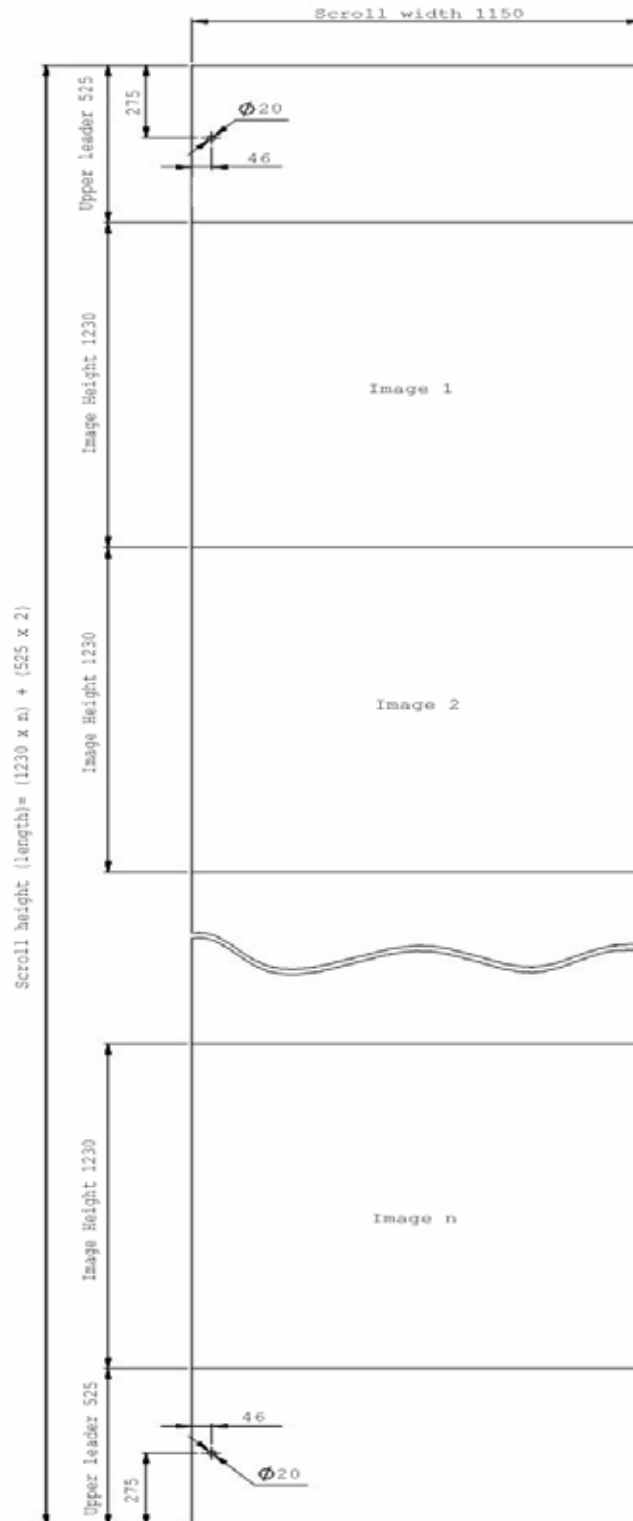
Global trouble troubleshooting

Symptom	Possible cause / remedy
ULSPDE is not working, no display on the programmer.	
Indicator on the power supply unit is not on.	Main power is not properly connected.
Indicator on the power supply unit is on but the indicator on the main control unit is not on.	Power not properly connected between the power supply unit and the main control unit.
Both power indicators are on.	Check the connection from the main control unit to the programmer.
Power indicators are on, the LED on the programmer shows ticking numbers but poster never scrolls	ULSPDE has been set as a slave unit (the master/slave jumper is plugged in).
ULSPDE seems to be working but doesn't stop at desired position.	The number of images is not correctly set. Refer to previous chapter for more information.

Appendix A. Programming with PC

Appendix B. Poster Production

Scroll layout



Appendix C. Decimal - Hexadecimal - DIP Switch Setting

Dec		DIP SW	Dec		DIP SW	Dec		DIP SW	Dec		DIP SW	Dec		DIP SW	Dec		DIP SW	Dec		DIP SW
1		↓↓↓↓↓↑↑↑	52		↓↑↑↓↑↓	103		↓↑↑↓↑↑↑	154		↑↓↑↑↓↑↓	205		↑↑↓↑↑↑↑			↑↑↓↑↑↑↑			↑↑↓↑↑↑↑
2		↓↓↓↓↓↑↑↓	53		↓↑↑↓↑↑↑	104		↓↑↑↓↑↓	155		↑↓↑↑↑↑↑	206		↑↑↓↑↑↑↓			↑↑↓↑↑↑↓			↑↑↓↑↑↑↓
3		↓↓↓↓↓↑↑↑	54		↓↑↑↓↑↑↓	105		↓↑↑↓↑↓	156		↑↓↑↑↑↑↓	207		↑↑↓↑↑↑↑			↑↑↓↑↑↑↑			↑↑↓↑↑↑↑
4		↓↓↓↓↓↑↓	55		↓↑↑↓↑↑↑	106		↓↑↑↓↑↓	157		↑↓↑↑↑↑↑	208		↑↑↓↑↓			↑↑↓↑↓			↑↑↓↑↓
5		↓↓↓↓↓↑↑↓	56		↓↑↑↑↓	107		↓↑↑↓↑↑↑	158		↑↓↑↑↑↑↓	209		↑↑↓↑↓			↑↑↓↑↓			↑↑↓↑↓
6		↓↓↓↓↓↑↑↑	57		↓↑↑↑↓	108		↓↑↑↓↑↓	159		↑↓↑↑↑↑↑	210		↑↑↓↑↓			↑↑↓↑↓			↑↑↓↑↓
7		↓↓↓↓↓↑↑↑	58		↓↑↑↑↓	109		↓↑↑↓↑↑	160		↑↓↑↓	211		↑↑↓↑↓			↑↑↓↑↓			↑↑↓↑↓
8		↓↓↓↓↓↑↓	59		↓↑↑↑↑↑	110		↓↑↑↓↑↑↓	161		↑↓↑↓	212		↑↑↓↑↓			↑↑↓↑↓			↑↑↓↑↓
9		↓↓↓↓↓↑↓	60		↓↑↑↑↑↓	111		↓↑↑↓↑↑↑	162		↑↓↑↓	213		↑↑↓↑↓			↑↑↓↑↓			↑↑↓↑↓
10		↓↓↓↓↓↑↓	61		↓↑↑↑↑↑	112		↓↑↑↓	163		↑↓↑↓	214		↑↑↓↑↓			↑↑↓↑↓			↑↑↓↑↓
11		↓↓↓↓↓↑↑↑	62		↓↑↑↑↑↓	113		↓↑↑↓	164		↑↓↑↓	215		↑↑↓↑↑↑			↑↑↓↑↑↑			↑↑↓↑↑↑
12		↓↓↓↓↓↑↓	63		↓↑↑↑↑↑	114		↓↑↑↓	165		↑↓↑↓	216		↑↑↓↑↓			↑↑↓↑↓			↑↑↓↑↓
13		↓↓↓↓↓↑↑↑	64		↓↑↓	115		↓↑↑↓↑↑	166		↑↓↑↓	217		↑↑↓↑↓			↑↑↓↑↓			↑↑↓↑↓
14		↓↓↓↓↓↑↑↓	65		↓↑↓	116		↓↑↑↓↓	167		↑↓↑↓	218		↑↑↓↑↓			↑↑↓↑↓			↑↑↓↑↓
15		↓↓↓↓↓↑↑↑	66		↓↑↓	117		↓↑↑↓↑↑	168		↑↓↑↓	219		↑↑↓↑↑			↑↑↓↑↑			↑↑↓↑↑
16		↓↓↓	67		↓↑↓	118		↓↑↑↓↑↓	169		↑↓↑↓	220		↑↑↓↑↑			↑↑↓↑↑			↑↑↓↑↑
17		↓↓↓	68		↓↑↓	119		↓↑↑↑	170		↑↓↑↓	221		↑↑↓↑↑			↑↑↓↑↑			↑↑↓↑↑
18		↓↓↓	69		↓↑↓	120		↓↑↑↑	171		↑↓↑↓	222		↑↑↓↑↑			↑↑↓↑↑			↑↑↓↑↑
19		↓↓↓	70		↓↑↓	121		↓↑↑↑	172		↑↓↑↓	223		↑↑↓↑↑↑			↑↑↓↑↑↑			↑↑↓↑↑↑
20		↓↓↓	71		↓↑↓	122		↓↑↑↑	173		↑↓↑↓	224		↑↑↓↓			↑↑↓↓			↑↑↓↓
21		↓↓↓	72		↓↑↓	123		↓↑↑↑	174		↑↓↑↓	225		↑↑↓↓			↑↑↓↓			↑↑↓↓
22		↓↓↓	73		↓↑↓	124		↓↑↑↑	175		↑↓↑↓	226		↑↑↓↓			↑↑↓↓			↑↑↓↓
23		↓↓↓	74		↓↑↓	125		↓↑↑↑	176		↑↓↑↓	227		↑↑↓↓			↑↑↓↓			↑↑↓↓
24		↓↓↓	75		↓↑↓	126		↓↑↑↑	177		↑↓↑↓	228		↑↑↓↓			↑↑↓↓			↑↑↓↓
25		↓↓↓	76		↓↑↓	127		↓↑↑↑	178		↑↓↑↓	229		↑↑↓↓			↑↑↓↓			↑↑↓↓
26		↓↓↓	77		↓↑↓	128		↑↓	179		↑↓↑↓	230		↑↑↓↓			↑↑↓↓			↑↑↓↓
27		↓↓↓	78		↓↑↓	129		↑↓	180		↑↓↑↓	231		↑↑↓↑↑			↑↑↓↑↑			↑↑↓↑↑
28		↓↓↓	79		↓↑↓	130		↑↓	181		↑↓↑↓	232		↑↑↓↓			↑↑↓↓			↑↑↓↓
29		↓↓↓	80		↓↑↓	131		↑↓	182		↑↓↑↓	233		↑↑↓↓			↑↑↓↓			↑↑↓↓
30		↓↓↓	81		↓↑↓	132		↑↓	183		↑↓↑↓	234		↑↑↓↓			↑↑↓↓			↑↑↓↓
31		↓↓↓	82		↓↑↓	133		↑↓	184		↑↓↑↓	235		↑↑↓↑↑			↑↑↓↑↑			↑↑↓↑↑
32		↓↓↓	83		↓↑↓	134		↑↓	185		↑↓↑↓	236		↑↑↓↓			↑↑↓↓			↑↑↓↓
33		↓↓↓	84		↓↑↓	135		↑↓	186		↑↓↑↓	237		↑↑↓↑			↑↑↓↑			↑↑↓↑
34		↓↓↓	85		↓↑↓	136		↑↓	187		↑↓↑↓	238		↑↑↓↑↑			↑↑↓↑↑			↑↑↓↑↑
35		↓↓↓	86		↓↑↓	137		↑↓	188		↑↓↑↓	239		↑↑↓↑↑			↑↑↓↑↑			↑↑↓↑↑
36		↓↓↓	87		↓↑↓	138		↑↓	189		↑↓↑↑	240		↑↑↑			↑↑↑			↑↑↑
37		↓↓↓	88		↓↑↓	139		↑↓	190		↑↓↑↑	241		↑↑↑			↑↑↑			↑↑↑
38		↓↓↓	89		↓↑↓	140		↑↓	191		↑↓↑↑	242		↑↑↑			↑↑↑			↑↑↑
39		↓↓↓	90		↓↑↓	141		↑↓	192		↑↑	243		↑↑↑			↑↑↑			↑↑↑
40		↓↓↓	91		↓↑↓	142		↑↓	193		↑↑	244		↑↑↑			↑↑↑			↑↑↑
41		↓↓↓	92		↓↑↓	143		↑↓	194		↑↑	245		↑↑↑			↑↑↑			↑↑↑
42		↓↓↓	93		↓↑↓	144		↑↓	195		↑↑	246		↑↑↑			↑↑↑			↑↑↑
43		↓↓↓	94		↓↑↓	145		↑↓	196		↑↑	247		↑↑↑			↑↑↑			↑↑↑
44		↓↓↓	95		↓↑↓	146		↑↓	197		↑↑	248		↑↑↑			↑↑↑			↑↑↑
45		↓↓↓	96		↓↑↓	147		↑↓	198		↑↑	249		↑↑↑			↑↑↑			↑↑↑
46		↓↓↓	97		↓↑↓	148		↑↓	199		↑↑	250		↑↑↑			↑↑↑			↑↑↑
47		↓↓↓	98		↓↑↓	149		↑↓	200		↑↑	251		↑↑↑			↑↑↑			↑↑↑
48		↓↓↓	99		↓↑↓	150		↑↓	201		↑↑	252		↑↑↑			↑↑↑			↑↑↑
49		↓↓↓	100		↓↑↓	151		↑↓	202		↑↑	253		↑↑↑			↑↑↑			↑↑↑
50		↓↓↓	101		↓↑↓	152		↑↓	203		↑↑	254		↑↑↑			↑↑↑			↑↑↑
51	33	↓↑↑	102	66	↓↑↓	153	99	↑↓	204	CC	↑↑	255	FF	↑↑↑						

Scrolling Poster Display Engine

ULSPDE-50/ULSPDE-51

User's Manual

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Key Components - - - - -	31
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Poster Production - - - - -	38
Troubleshooting - - - - -	40

Overview

Thank you for purchasing ULSPDE, which represents the latest technology in scrolling poster display. Please read this manual carefully before installation.

ULSPDE features an innovative control logic that removes the need for using external sensors and foil stickers (or markers). This technology makes scrolling advertising signs much more reliable and easier to use.

Currently, there are four models in our ULSPDE family:

Model	Roller diameter	Maximum applicable width	Motor type
ULSPDE-50	51mm	1.2M	In-roller DC motors
ULSPDE-51	51mm	2M	External DC motors with synchronous belts
ULSPDE-76	76mm	3.5M	In-roller BLDC motors
ULSPDE-114	114mm	6M	External DC motors with synchronous belts

This manual focuses on ULSPDE-50 and ULSPDE-51.

For more product information, please visit www.eshow.ca or contact at 905-889-1200

Disclaimer

While every effort has been made to ensure that the information contained in this User's Manual is accurate and up-to-date, no liability for error or omission will be accepted. Beidouxing Science and Technology Development Co. Ltd. reserves the right to change the functions, features and specifications of its products at any time without prior notice.

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ULSPDE, Scrolling Poster Display Engine, SPDS, Scrolling Poster Display System, Scroll-a-Sound, POPS (Power Off Poster Settling) are trademarks of Beidouxing Science and Technology Development Co. Ltd.

Safety Notes

To ensure continuous safe operation of the product, please read the following safety notes carefully. Please contact us if you have any question or require additional information concerning product safety.

Electricity safety

- The product should be assembled and installed by qualified electrician.
- Power source for the product must matches the product specifications; power outlet must be properly grounded.
- Disconnect the main power supply if any of the following occurs:
 - Unusual noise or odour is noticed
 - Any electrical cable is found damaged
 - Any component has been exposed to water or other liquid
 - Any component appears physically damaged







Operational safety



- Follow all warnings and instructions marked on or supplied with the product.
- Install the product only on structure with adequate strength.
- Install the product only in appropriate weatherproof and dust proof housing.
- Make sure that ambient operation temperature for the product is in range -15°C to 45°C, humidity 20% to 85%.

*If you only want to learn how to use complete BDX scrolling sign(s) built with ULSPDE scrolling system(s), you may go straight to the chapter **Operation**.*

Key Components

The table below shows the key components of SPDE


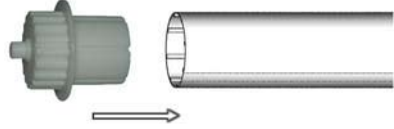

	<p>Rollers</p> <ul style="list-style-type: none"> * Specially designed extruded aluminium round hollow * Two rollers are used in each scrolling system. * Hole near one end of each roller for the scroll end detector.
<p>ULSPDE-50 Motor Assembly</p>  <p>ULSPDE-51 Motor Assembly</p>	<p>Motor Assemblies</p> <p>ULSPDE-50: two in-roller DC motors ULSPDE-51: two external DC motors ULSPDE-76: two in-roller BLDC motors ULSPDE-114: three external DC motors (two on top and one at bottom)</p>
	<p>Scroll End Detectors</p> <p>Fitted on the right hand side of each roller</p>
	<p>Main Control Unit</p> <p>The main control unit processes all signals, controls the scrolling movement and poster positioning. A communication port and a multi-function extension port are also included.</p>
	<p>Power Supply Unit</p> <p>Switching mode power supply unit provides 24V regulated DC power to the scrolling system.</p>
	<p>Other Hardware</p> <p>Such as roller saddles and cramps, bearings, mounting brackets, etc.</p>

	<p>Programmer</p> <p>A simple keypad with three-digit LED display, for programming and monitoring the operation status of the ULSPDE.</p>
	<p>User's Manual</p> <p>Please read this User's Manual carefully before working on the product.</p> <p>Visit our web site regularly for the latest product information and technical updates.</p>

For complete list of ULSPDE components, please contact our sales or technical support department.

Installation

I. Roller assembling

<p>ULSPDE-50</p> <p>Insert the motor assembly into the round aluminium hollow.</p> <p>Insert the motor assembly along the tracks inside the aluminium hollow.</p> <p>IMPORTANT: The ground cable terminated with a spade must be securely connected to ground (i.e. typically the chassis).</p>	
<p>ULSPDE-51</p> <p>Insert the pulley along the tracks inside the aluminium hollow.</p> <p>Note: The ULSPDE-51 motor assemblies are to be installed next to the roller and coupled with synchronous belts.</p>	
<p>Insert the scroll end detector assembly in to the round aluminium hollow.</p> <p>Hold down the scroll-end detector tip when inserting, and make sure that the tip can sticks out the hole on the aluminium hollow and be pressed down freely when finished.</p> <p>IMPORTANT: The ground cable terminated with a spade must be securely connected to ground (typically the chassis).</p>	

II. Roller installation

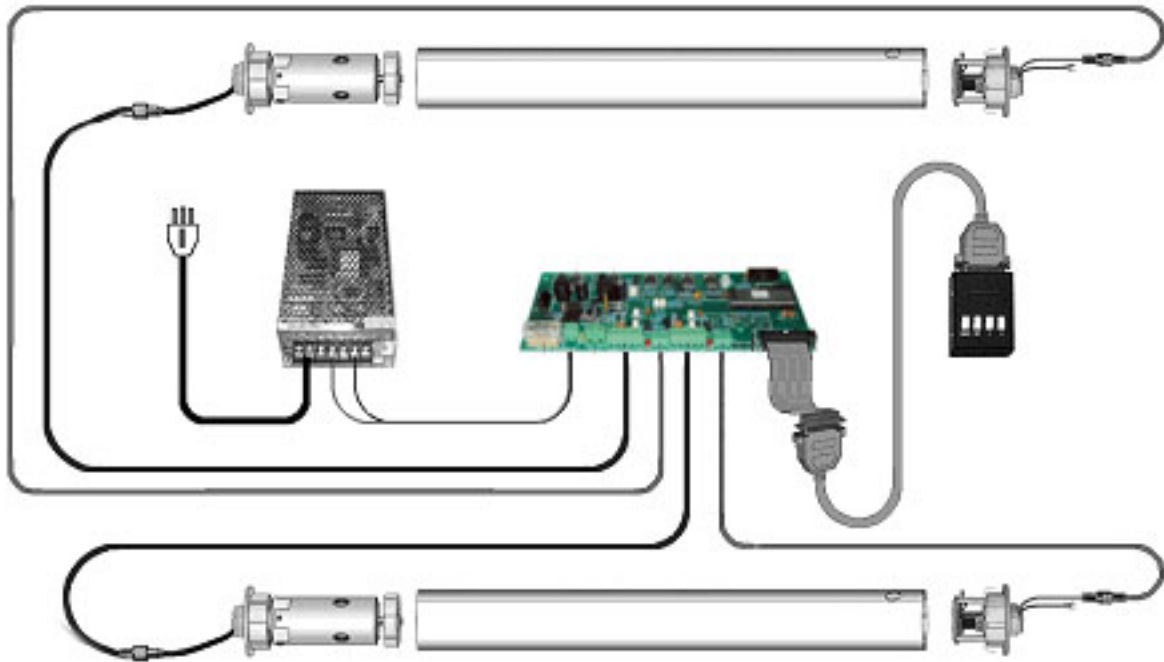
Fix the four of plastic roller saddles on the casing, then mount the rollers. On ULSPDE-51, couple the roller and the motor assemblies with synchronous belts, adjust the positions of the motor assemblies for appropriate tension and fix the motor assemblies on the casing frame.

We recommend that the rollers are installed horizontally in a parallel arrangement. Both rollers should be positioned so that the motor is on the left and the scroll end detector on the right. Vertical installation is not advisable.

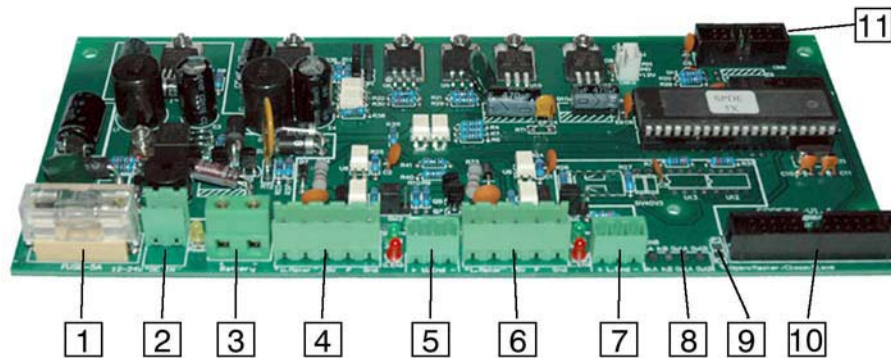


III. Wirings

1. General Schematic

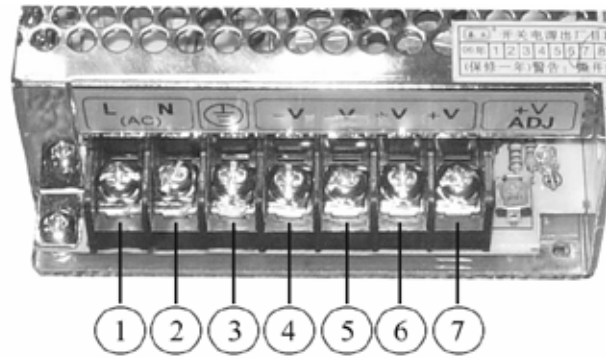


2. Main Controller Unit



1. Main PCB Fuse (3A Fast Blow)
2. Main PCB Power In
3. Battery in (for optional POPS)
4. Upper Motor Connector
5. Upper Scroll End Detector Connector
6. Lower Motor Connector
7. Lower Scroll End Detector Connector
8. Synchronisation connector (optional)
9. Master/Slave selection jumper for synchronisation. open for Master unit, shorted for slave unit(s)
10. Programmer Port (for connecting the hand held programmer via a ribbon cable and a DB25 socket)
11. Extension port

3. Switching Mode Power Supply



- a. Main Power Live
- b. Main Power Neutral
- c. Main Power Earth
- d. DC Output Negative
- e. DC Output Negative (spare)
- f. DC Output Positive
- g. DC Output Positive (spare)

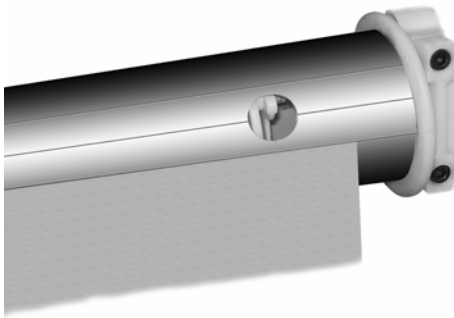
Important: All ground/earth terminals and cables must be securely connected to ground (typically the chassis), or severe damage could be caused. Please consult a qualified electrician if you have any doubt.

Installation

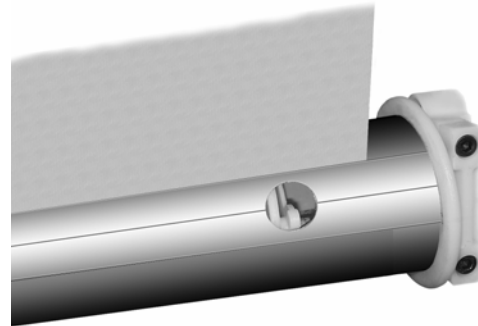
I. Loading Poster

ULSPDE poster scroll is fixed on the rollers by adhesive tape. The round aluminium hollow has been extruded with lines the outer cylinder for poster alignment. On the upper roller, align the poster to the line below the scroll end detector hole; on the lower roller, align the poster to the line above the scroll end detector hole.

1. Fix the upper end of the poster scroll on the upper roller, make sure it's balanced and well aligned;
2. Wind up the scroll onto the upper roller using the manual scrolling function (see next page). If the scroll significantly shifts to left or right, redo from step 1;
3. Pull down the lower end of the scroll and fix it to the lower roller, make sure it's balanced and well aligned;
4. Use the manual scrolling function to scroll the poster all the way down and all the way back up. If the poster is shifting, wrinkling or not scrolling smoothly in any way, redo from step 1;
5. Check the holes on the poster scroll at both ends, and make sure they are well aligned with the sensor holes on the roller and the sensor tip can pop up freely. Trim the edges of the holes on the poster if necessary.



Poster on the upper roller



Poster on the lower roller

Optionally, scroll lead may be pre-fixed on the roller, and poster loaded by using special zipper. Please contact us for more information.

II. Configuration

Entering configuration mode (or set-up mode)

To enter the Configuration mode, plug in the programmer, hold down both [+] and [-] buttons, turn on the power or press the [Reset] button if the ULSPDE is already on, then release all buttons (please note that if the [Reset] button was pressed, it must be released first).

Main Menu

After releasing all buttons, the LEDs will show “F-1”. This is the main menu of the configuration mode and the low digit (the digit on the right hand side) is the number of function. Use [-] or [+] button to change function and use [Set] button to select the function.

The current version of SPDE firmware has only functions, F-1 and F-2. (More functions could be added for special purpose. Please do NOT use them unless advised by the manufacturer).

F-1: Set-up

When ULSPDE enters Set-up function, the first set-up item will be shown on the LED display. Please refer to the following tables for definitions of the buttons and LED display.

Functions of the buttons

[Reset]	[Set]	[-]	[+]
Reset SPDE without saving any change of settings	Go to the next set-up item	Decrease the setting value	Increase the setting value

Definitions of the LED display

High digit	Middle digit	Low digit
<i>Current set-up item</i>	<i>Current setting value</i>	
P Hexadecimal number of images	From 2 to F (15) Correcting setting of this item is essential for accurate scrolling and positioning.	
0 Global display duration	From 0 to 99 (seconds). 0 will be overwritten by display duration settings for individual image. Setting other than 0 will apply to all images and individual display duration settings will be skipped.	
1 to F Display duration of individual images (hexadecimally numbered)	From 1 to 99 (seconds)	

When the [Set] button is pressed at the last set-up item, the LED will display “HHH” briefly indicating all changes are being saved, and the ULSPDE will return to the main menu of the configuration mode.

F-2: Manual scrolling

This function is particularly useful for loading poster and for trouble shooting.

In this function, three bars are shown on the LED display resembling the scrolling movement.

Simply press [+] or [-] button to scroll the poster up or down; press [Set] button to return to the main menu of the Configuration mode.

F-3: Service information

Current, all ULSPDEs except SPDE-76 have this function. It works similar to F-2 but every time the [-] or [+] button is pressed, the motor runs for only a short and fixed period of time. The LEDs on the programmer will then show the reading of the movement of the relevant motor. This function is mainly for trouble-shooting purpose.

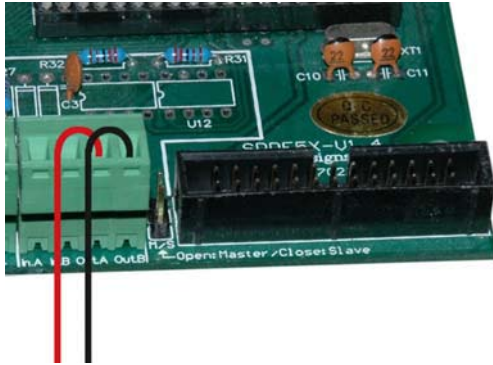
Programmer in Normal mode

In normal mode, the programmer shows the status of the ULSPDE. The high digit of the LED display shows the current number of image and the other two digits show the duration of the display in second.

III. Synchronisation (optional)

A number of ULSPDE can be configured to operate synchronously.

Please use RS485 compliant twisted pair cable. The pictures below show how cables are connected to the main controller box.



Connection on a Master Unit



Connection on a Slave Unit

If more than two units need to be synchronised, connection can be made in either parallel or relaying manner.

In each set-up, only one unit should be set as master and all the rest should be set as slave(s). number of images needs to be set on each unit correctly, but timing only needs to be set on the master unit.

Please note that the communication port could be programmed for certain options (e.g. GSM Monitor, etc.) that are incompatible with synchronisation function. Please check with us for more information.

Poster production

Poster for ULSPDE can be produced by large format inkjet printing or screen-printing. While a wide range of materials can be used, stock in range 100g to 200g are recommended.

Vinyl banner (PVC base-flex) is not recommended for scroll wider than 1.5m. We recommend weather proof PP paper (synthetic paper).

The layout of a poster scroll for SPDE is shown on the right. Calculations of the dimensions are as follows.

Poster Scroll Dimensions

When the centre to centre spacing of the two rollers is A, the length of each roller is B and the number of images on the scroll is n,

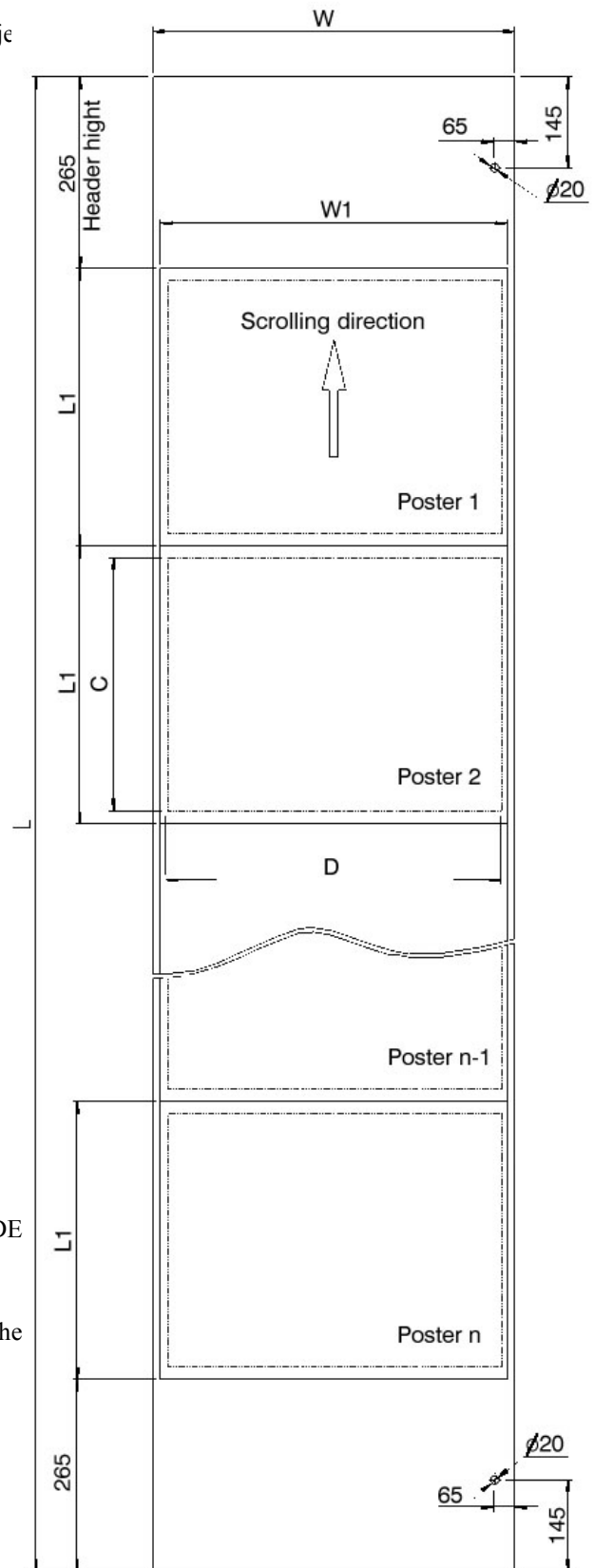
	ULSPDE-50	ULSPDE-51
Viewing windows (H0 x W0)	(A-20) x (B-66)	(A-40) x (B-73)
Image (H1 x W1)	(A+20) x (B-26)	(A+20) x (B-40)
Overall width (W2)	B-10	B-10
Scroll Length (H2)	$n \times H1 + 530$	$n \times H1 + 530$

Unit: mm

Please note that:

- the roller length B is the length of the round aluminium hollow, and
- while the maximum number of images (n) that ULSPDE supports is 15, it is often restricted by the weight and length of the scroll length.

For smooth operation of ULSPDE, it is important to make sure the poster scroll is wrinkle free and the edges trimmed straight.



Troubleshooting

While doing troubleshooting, always plug in the programmer for the LED display on the programmer could provide important clues.

Symptom	Possible cause / remedy
The ULSPDE is not working, no display on the programmer.	
Indicator on the power supply unit is not on.	Main power is not properly connected.
Indicator on the power supply unit is on but the indicator on the main control unit is not on.	Power not properly connected between the power supply unit and the main control unit.
Both power indicators are on.	Check the connection from the main control unit to the programmer.
The power indicators are on, the LED on the programmer shows ticking numbers but poster never scrolls	ULSPDE has been set as a slave unit (the master/slave jumper is plugged in.)
The ULSPDE seems to be working but doesn't stop at desired position.	The number of images is not correctly set. Refer to previous chapter for more information.
The ULSPDE sometimes run briefly and stop, and run briefly again and stop again...	<ul style="list-style-type: none">* Check and reconnect the motor cables;* Make sure that the scroll, particularly the edges, is jamming or blocked;* Make sure the thickness/weight of the scroll material is compliant with our requirement (see the last chapter of this menu).

U L S P D E

Scrolling Poster Display Engine

User's manual

(Jan 2007)

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System Configuration	48
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Overview

Thank you for purchasing ULSPDE, which presents the latest technology in scrolling poster display.

ULSPDE offers a simple, yet sophisticated scrolling advertising solution that can be widely deployed. Consisting of two intelligent powered rollers, a main control unit and a power supply unit, no more external sensors, no need for sensor tags on the poster, ULSPDE makes building and using scrolling advertising signs easier than ever.

Main features of ULSPDE

Ease of installation	No more external sensor is required as motors and all transmission parts are built inside the roller, making the structure very simple.
Ease of operation	Scrolling movement and positioning are controlled by our proprietary algorithm, which does not require any sensor tag on the poster.
High speed	The scrolling speed can be up to 50cm per second, faster than many scrolling signs in the market.
Reliability	Equipped with brushless motors and planetary gearheads, which ensure great reliability and durability.
Versatility	ULSPDE can be installed in a broad range of casings for building new scrolling signs or upgrading existing static signs. Synchronisation function is already included as standard.
Programmability	Display duration of the posters is programmable globally or individually.
Scalability:	ULSPDE is compatible with most of the eShow Signs options such as timer switch, real-time clock module, Scroll-a-Sound, POPS (Power Off Poster Settling), photo sensing switch, GSM-based monitoring system, etc.

Disclaimer

While every effort has been made to ensure that the information contained in this User's Manual is accurate and up-to-date, no liability for error or omission will be accepted. Beidouxing Science and Technology Development Co. Ltd. reserves the right to change the functions, features and specifications of its products at any time without prior notice.

Intellectual Property

Information contained in this User's Manual is the property of Beidouxing Science and Technology Development Co. Ltd. and may not be reproduced without prior written consent.

ULSPDE, Scrolling Poster Display Engine, ULSPDS, Scrolling Poster Display System, Scroll-a-Sound, POPS (Power Off Poster Settling) are trademarks of Beidouxing Science and Technology Development Co. Ltd.

Safety Notes

To ensure continuous safe operation of the product, please read the following safety notes carefully. Please contact us if you have any question or require additional information concerning product safety.


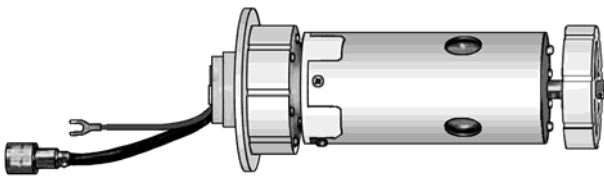
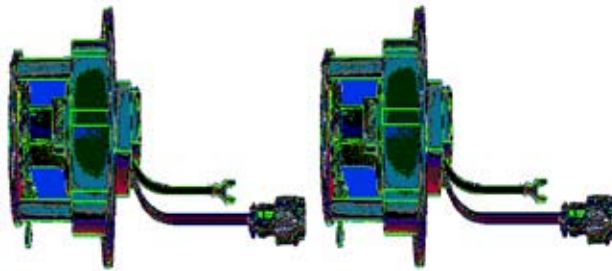
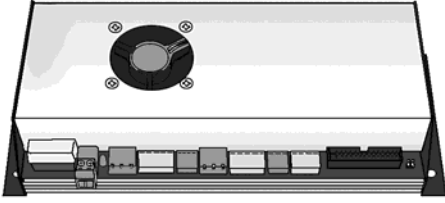
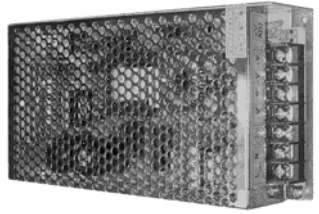
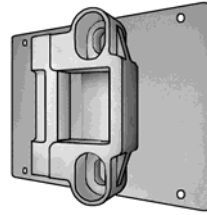
Electricity safety

- The product should be assembled and installed by qualified electrician.
- Power source for the product must matches the product specifications; power outlet must be properly grounded.
- Disconnect the main power supply if any of the following occurs:
 - Unusual noise or odour is noticed
 - Any electrical cable is found damaged
 - Any component has been exposed to water or other liquid
 - Any component appears physically damaged

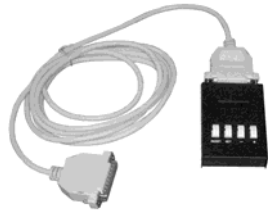

Operational safety

- * Follow all warnings and instructions marked on or supplied with the product.
- * Install the product only on structure with adequate strength.
- * Install the product only in appropriate weatherproof and dust proof housing.
- * Make sure that ambient operation temperature for the product is in range -15°C to 45°C, humidity 20% to 85%.

Main Components

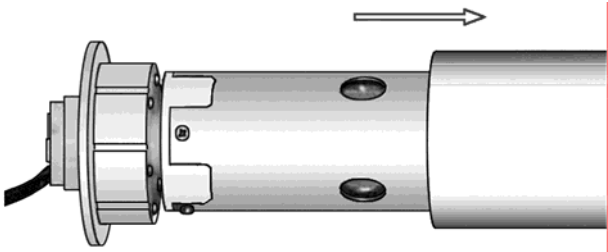
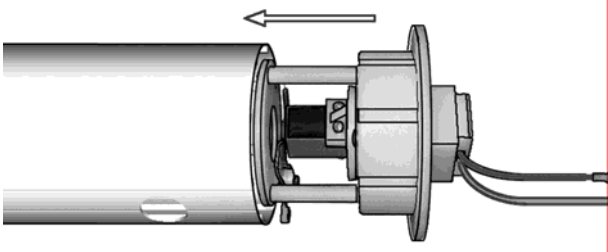
Descriptions	Qty.	Picture
Round Aluminium Hollow Specially designed aluminium extrusion, pre-cut to 3 metre length. Hole for the scroll end-detecting finger is pre-drilled.	2	
Motor Assembly Including motor, roller header, bearing, driving block etc. To be fitted inside the round aluminium hollow. Extension cable for connecting the main control unit also included.	2	
Scroll End Detector Assembly Including end-detecting finger and sensor for detecting the end of a poster scroll. To be fitted inside the round aluminium hollow. Extension cable for connecting the main control unit also included.	2	
Main Control Unit Built with the main PCB that processes all signals, controls the scrolling movement and poster positioning. A multi-function extension port is also built on board.	1	
Power Supply Unit Switching mode power supply unit with regulated 24VDC output. Input voltage can be set to 110VAC or 220VAV by using an on-board switch.	1	
Mounting kit Including a set of plastic socket that detachably holds the roller, and a metal plate that couples the plastic socket and the main structure on which ULSPDE is installed.	4	

Contents of Package (Cont.)

Descriptions	Qty.	Picture
<p>Programmer</p> <p>User interface for entering user settings and displaying operation status.</p> <p>An extension ribbon cable for connecting the main control unit is also included.</p>	1	
<p>User's Manual</p> <p>Please read this User's Manual carefully before working on the product.</p> <p>Visit our web site regularly for the latest product information and technical updates.</p>	1	

Installation

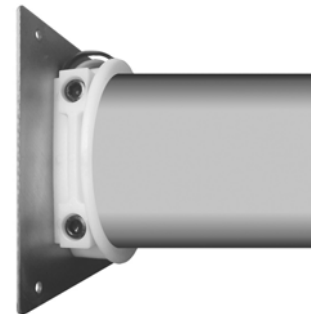
I. Roller assembling

<p>Insert the motor assembly into the round aluminium hollow.</p> <p>Insert the motor assembly along the tracks inside the aluminium hollow.</p> <p>IMPORTANT: The ground cable terminated with a spade must be securely connected to ground (typically the chassis).</p>	
<p>Insert the scroll end detector assembly in to the round aluminium hollow.</p> <p>Hold down the detecting finger when inserting, and make sure that the detecting finger sticks out the hole on the aluminium hollow when the finished.</p> <p>IMPORTANT: The ground cable terminated with a spade must be securely connected to ground (typically the chassis).</p>	

II. Roller installation

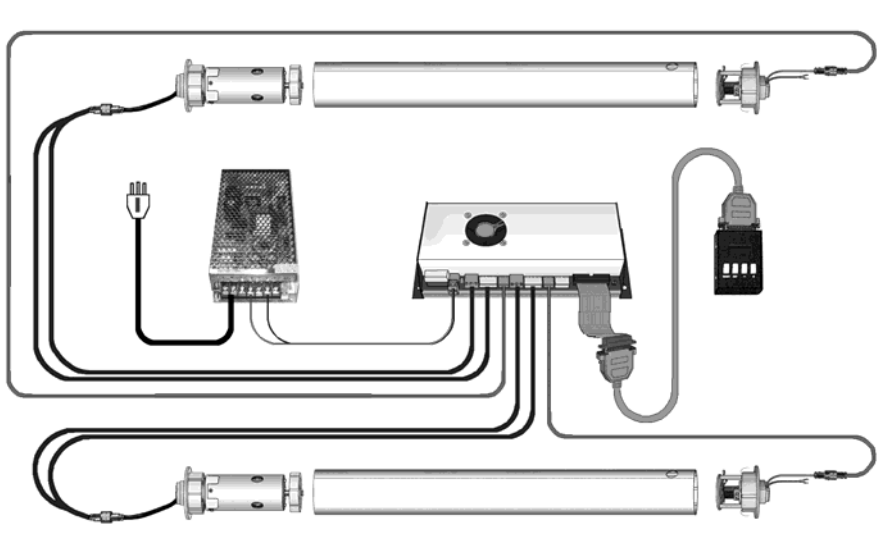
Fix the plastic roller socket on the metal plate, then install all the four assembled mounting kits on the main structure of the scrolling display.

We recommend that the rollers are installed horizontally in a parallel arrangement. Both rollers should be positioned so that the motor is on the left and the scroll end detector on the right. Vertical installation is not advisable.

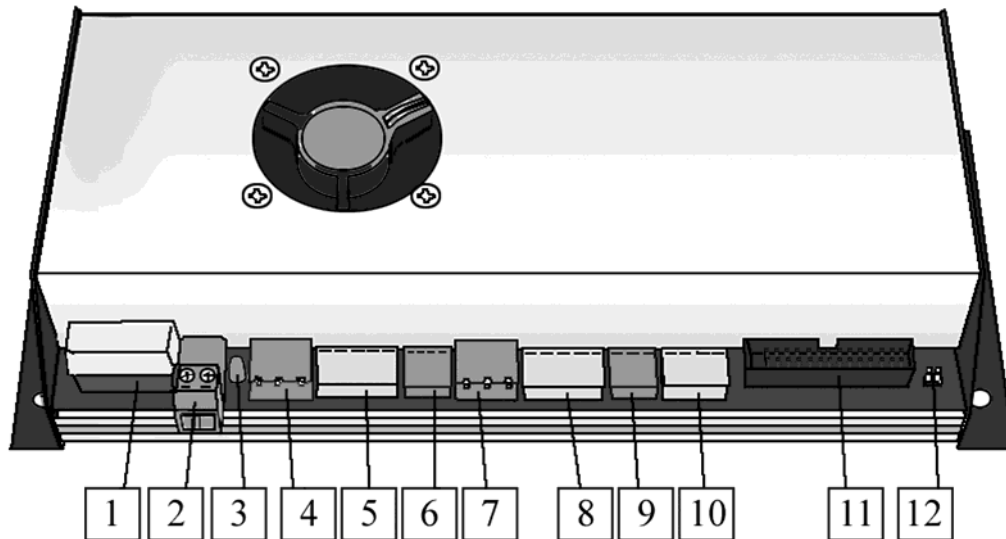


III. Wirings

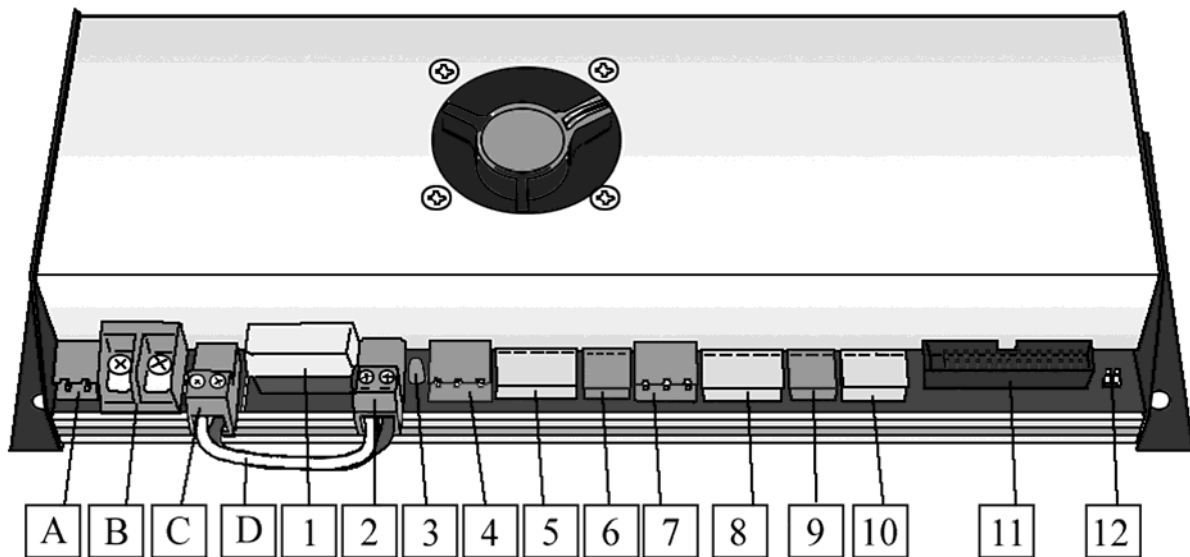
1. General Schematic



2. Main Controller Unit



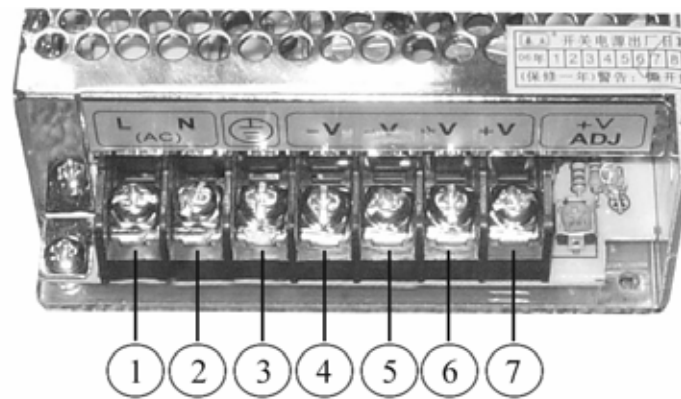
Standard unit



Unit with POPS (Power-Off Poster Settling) option fitted

- A. DC Power In (12V – 24V DC)
- B. POPS Battery Power In (12V)
- C. POPS Power Out
- D. POPS Power Jumper Lead
- 1. Main PCB Fuse (5A Fast Blow)
- 2. Main PCB Power In
- 3. Main PCB Power Indicator
- 4. Upper Motor Connector (Green)
- 5. Upper Motor Connector (Orange)
- 6. Upper Scroll End Sensor Connector
- 7. Lower Motor Connector (Green)
- 8. Lower Motor Connector (Orange)
- 9. Lower Scroll End Sensor Connector
- 10. Communication Port (2xRS485, from left In A, In B, Out A, Out B)
- 11. Programmer Port (for connecting the hand held programmer via a ribbon cable and a DB25 socket)
- 12. Master/Slave selection jumper for synchronisation. open for Master unit, shorted for slave unit(s)

3. Switching Mode Power Supply



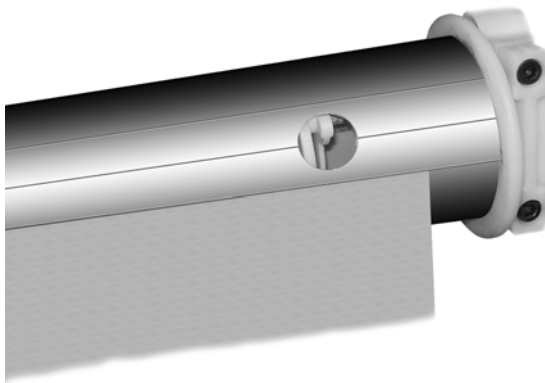
- a. Main Power Live
- b. Main Power Neutral
- c. Main Power Earth
- d. DC Output Negative
- e. DC Output Negative (spare)
- f. DC Output Positive
- g. DC Output Positive (spare)

Important: All ground/earth terminals and cables must be securely connected to ground (typically the chassis), or severe damage could be caused. Please consult a qualified electrician if you have any doubt.

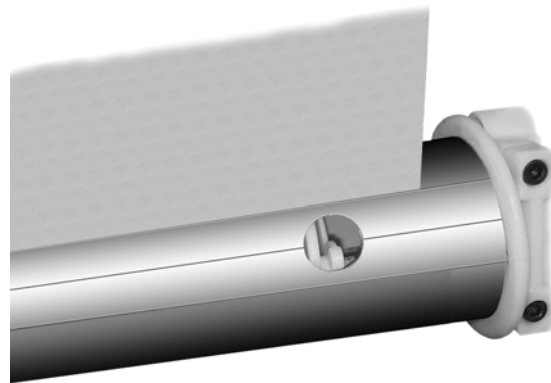
IV. Loading Poster

ULSPDE poster scroll is fixed on the rollers by adhesive tape.

The round aluminium hollow has been extruded with lines the outer cylinder for poster alignment. On the upper roller, align the poster to the line below the scroll end detector hole; on the lower roller, align the poster to the line above the scroll end detector hole.



Poster on the upper roller



Poster on the Lower roller

Optionally, scroll lead may be pre-fixed on the roller, and poster loaded by using special zipper. Please contact us for more information.

System Configuration

Entering configuration mode (or set-up mode)

To enter the Configuration mode, plug in the programmer, hold down both [+] and [-] buttons, turn on the power or press the [Reset] button if the ULSPDE is already on, then release all buttons (please note that if the [Reset] button was pressed, it must be released first).

Main Menu

After releasing all buttons, the LEDs will show “F-1”. This is the main menu of the configuration mode and the low digit (the digit on the right hand side) is the number of function. Use [-] or [+] button to change function and use [Set] button to select the function.

The current version of ULSPDE firmware has only functions, F-1 and F-2. (More functions could be added for special purpose. Please do NOT use them unless advised by the manufacturer).

F-1: Set-up

When ULSPDE enters Set-up function, the first set-up item will be shown on the LED display. Please refer to the following tables for definitions of the buttons and LED display.

Functions of the buttons

[Reset]	[Set]	[-]	[+]
Reset ULSPDE without saving any change of settings	Go to the next set-up item	Decrease the setting value	Increase the setting value

Definitions of the LED display

High digit	Middle digit	Low digit
<i>Current set-up item</i>	<i>Current setting value</i>	
P Hexadecimal number of images	From 2 to F (15) Correcting setting of this item is essential for accurate scrolling and positioning.	
0 Global display duration	From 0 to 99 (seconds). 0 will be overwritten by display duration settings for individual image. Setting other than 0 will apply to all images and individual display duration settings will be skipped.	
1 to F Display duration of individual images (hexadecimally numbered)	From 1 to 99 (seconds)	

When the [Set] button is pressed at the last set-up item, the LED will display “HHH” briefly indicating all changes are being saved, and the ULSPDE will return to the main menu of the configuration mode.

F-2: Manual scrolling

This function is particularly useful for loading poster and for trouble shooting.

In this function, three bars are shown on the LED display resembling the scrolling movement.

Simply press [+] or [-] button to scroll the poster up or down; press [Set] button to return to the main menu of the Configuration mode.

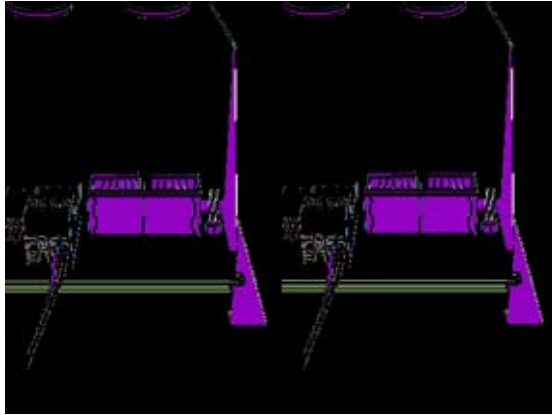
Programmer in Normal mode

In normal mode, the programmer shows the status of the SPDE. The high digit of the LED display shows the current number of image and the other two digits show the duration of the display in second.

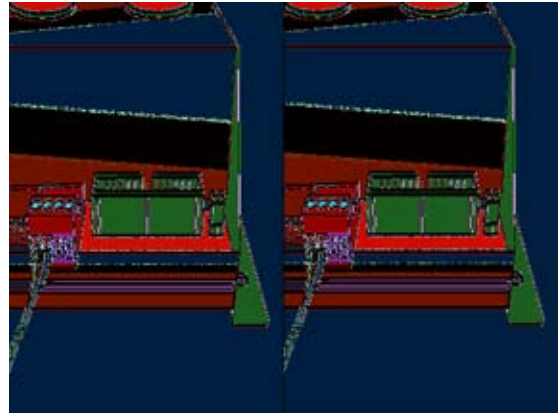
Synchronisation

A number of ULSPDE can be configured to operate synchronously.

Please use RS485 compliant twisted pair cable. The pictures below show how cables are connected to the main controller box.



Connection on a Master Unit



Connection on a Slave Unit

If more than two units need to be synchronised, connection can be made in either parallel or relaying manner.

In each set-up, only one unit should be set as master and all the rest should be set as slave(s). number of images needs to be set on each unit correctly, but timing only needs to be set on the master unit.

Please note that the communication port could be programmed for certain options (e.g. GSM Monitor, etc.) that are incompatible with synchronisation function. Please check with us for more information.

Poster production

Poster for ULSPDE can be produced by large format inkjet printing or screen-printing. While a wide range of materials can be used, stock in range 100g to 200g are recommended.

Vinyl banner (PVC base-flex) is not recommended for scroll wider than 1.5m. We recommend weather proof PP paper (syenitic paper).

The layout of a poster scroll for ULSPDE is shown on the right. Calculations of the dimensions are as follows.

Poster Scroll Dimensions (76 series)

When the centre to centre spacing of the two rollers is A, the length of each roller is B and the number of images on the scroll is n,

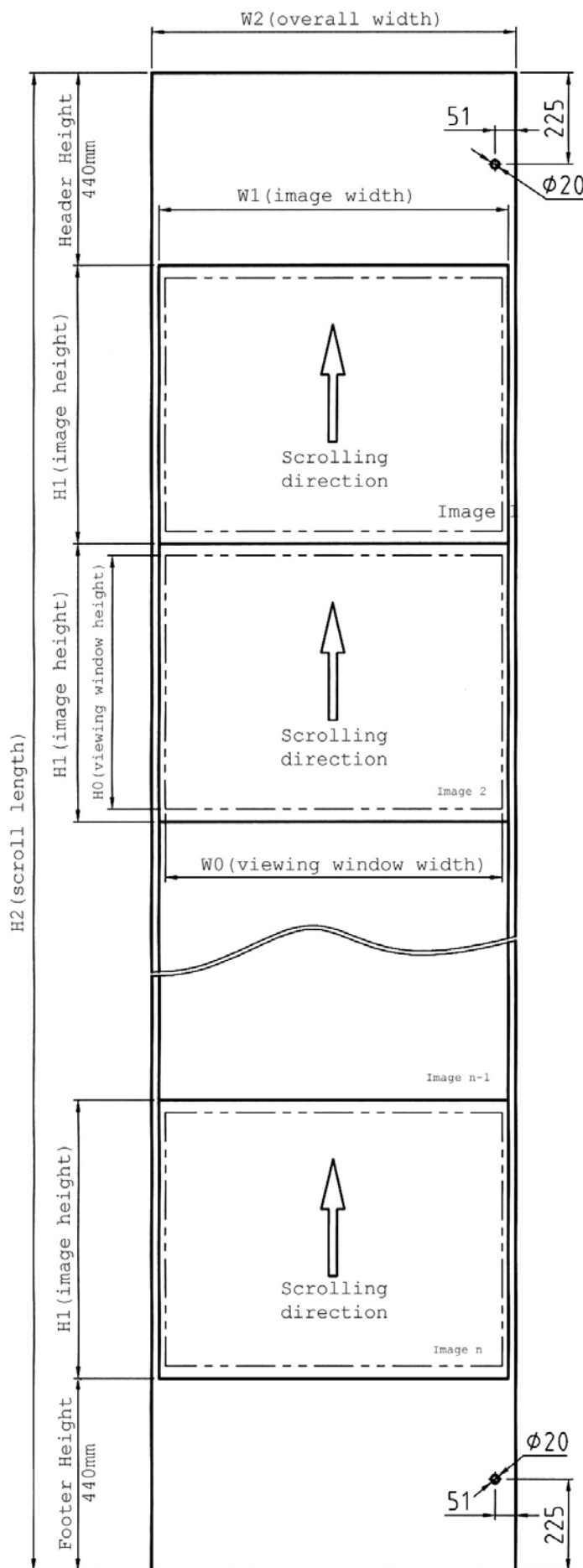
Viewing windows (H0 x W0)	(A-40) x (B-100)
Image (H1 x W1)	(A+20) x (B-30)
Overall width (W2)	B-20
Scroll Length (H2)	n x H1 + 880 (12,000 maximum)

Unit: mm

Please note that:

- the roller length B is the length of the round aluminium hollow, and
- while the maximum number of images (n) that ULSPDE supports is 15, it is often restricted by the maximum value of the scroll length (H2).

For smooth operation of ULSPDE, it is important to make sure the poster scroll is wrinkle free and the edges trimmed straight.



Troubleshooting

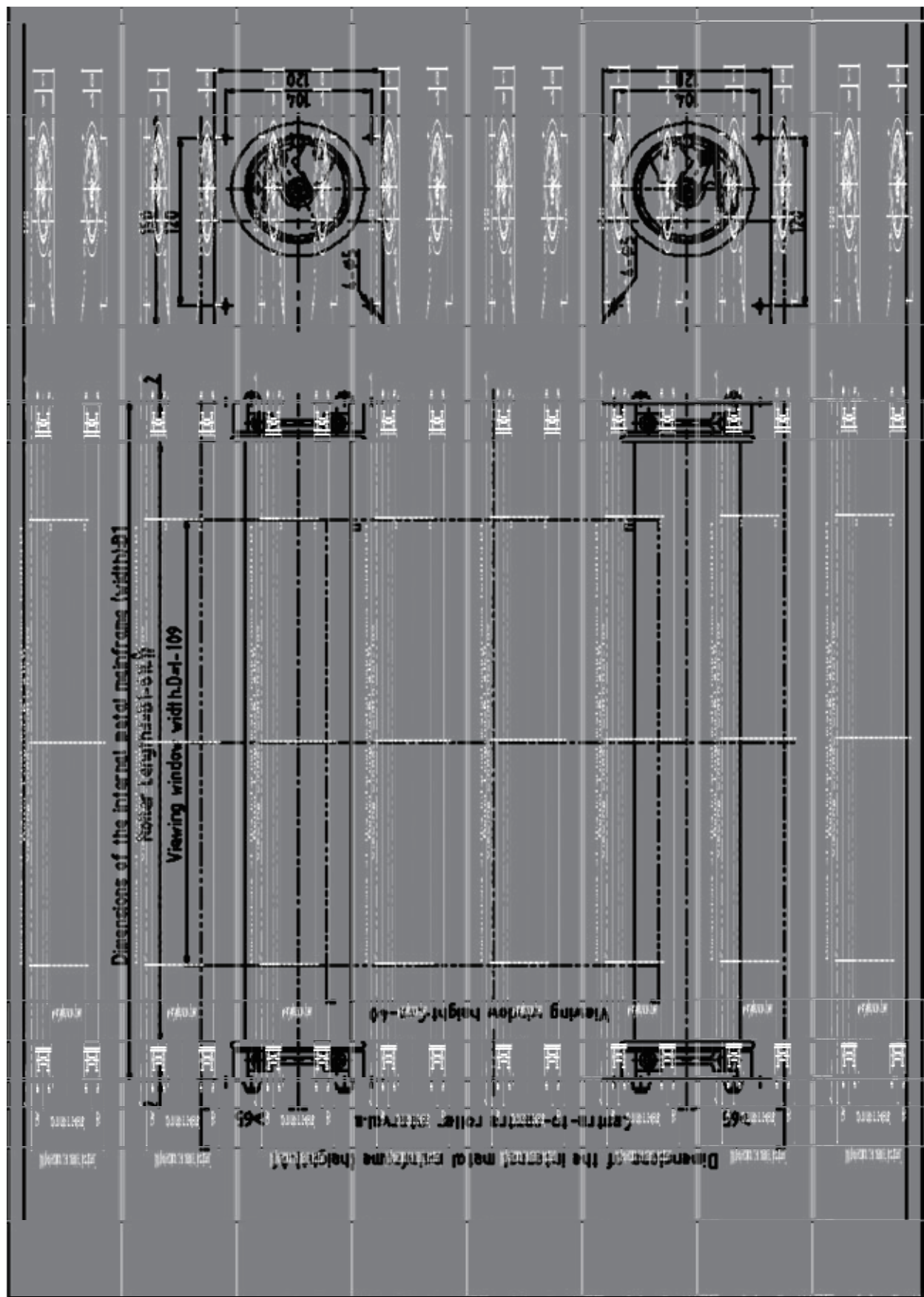
While doing troubleshooting, always plug in the programmer for the LED display on the programmer could provide important clues.

Symptom	Possible cause / remedy
The ULSPDE is not working, no display on the programmer.	
Indicator on the power supply unit is not on.	Main power is not properly connected.
Indicator on the power supply unit is on but the indicator on the main control unit is not on.	Power not properly connected between the power supply unit and the main control unit.
Both power indicators are on.	Check the connection from the main control unit to the programmer.
The power indicators are on, the LED on the programmer shows ticking numbers but poster never scrolls	ULSPDE has been set as a slave unit (the master/slave jumper is plugged in).
The ULSPDE seems to be working but doesn't stop at desired position.	The number of images is not correctly set. Refer to previous chapter for more information.
The ULSPDE sometimes run briefly and stop, and run briefly again and stop again...	<ol style="list-style-type: none">1. Check and reconnect the motor cables;2. Make sure that the scroll, particularly the edges, is jamming or blocked;3. Make sure the thickness/weight of the scroll material is compliant with our requirement (see the last ector of this menu).

Specification (ULSPDE76)

Package and size	Two cartons, 360mm x 240mm x 200mm and 3,050mm x 190mm x 90mm respectively
Gross weight	16.5 kg
Net weight	13kg
Maximum size of scrolling display	6 square metres (maximum width 3 metres)
Power supply	100-120VAC or 200-240VAC selectable
Power consumption (average)	50W

Installation guide(ULSPDE-76)



Scrolling Poster Display System

User's Manual

February 2004

All right reserved

Thank you for purchasing our product.

Scrolling Poster Display System integrates advanced mechanical, electronic and digital control technologies to achieve significant advantages in both functionality and reliability.

Scrolling Poster Display System is a multi-image advertising or information billboard designed for both indoor and outdoor applications. It can carry up to 15 posters on a scroll; controlled by a microcomputer, stay time of each poster can be precisely programmed to 1 to 30 seconds.

Up to ten Scrolling Poster Display Systems can run synchronised to deliver breath-taking visual effect.

I. Exteriors and interface

As shown in Fig. 1, a typical Scrolling Poster Display System comprises a metal casing and a front cover. The front cover is either hinged or screw-mounted to the casing. The viewing window on the front cover is typically fitted with a poly-carbonate or acrylic board. A power cord is drawn off the casing. A D25 socket is fitted on the casing (usually on the lower side, Fig 2) for connecting an external programmer (Fig. 4) which is a user interface for viewing the status and changing the settings of the system. An optional connector may be fitted, for synchronized operation.



Fig. 1



Fig. 2

II. Internal structure and principle of operation

Fig. 3 shows the interior of a Scrolling Poster Display System. It includes 2 main assemblies: illumination and poster display.

Illumination assembly is simply daylight fluorescent lamp(s) with electronic or electric magnetic ballast(s).

Poster display assembly comprises two MCU controlled geared motors that respectively drive the rollers on opposite sides of the viewing window. The poster scroll is wound on two opposing rollers. Multi-image display is effectuated by the reciprocating movement of the posters translated from the rotations of the rollers. A group of sensors monitor the movement of the poster and feed back the signals to the main PCB.

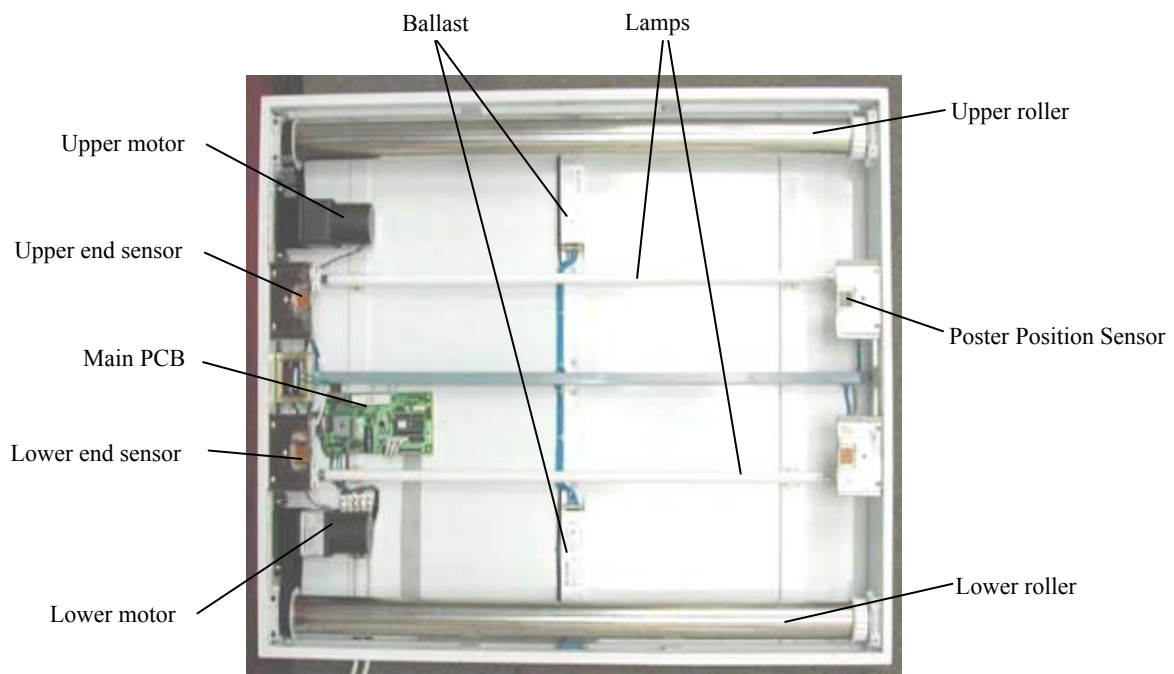


Fig. 3

III. The programmer

Each Scrolling Poster Display System is shipped with an external programmer (Fig. 4). To use the programmer, connect its D25 plug to the D25 socket on the system (Fig. 2) anytime. Whether or not the programmer is plugged in does not affect the operation of the system.

The functions of the programmer include:

1. Showing the status of the system
2. Display timing set-up
3. Manual scrolling control for loading/unloading and adjusting the posters.

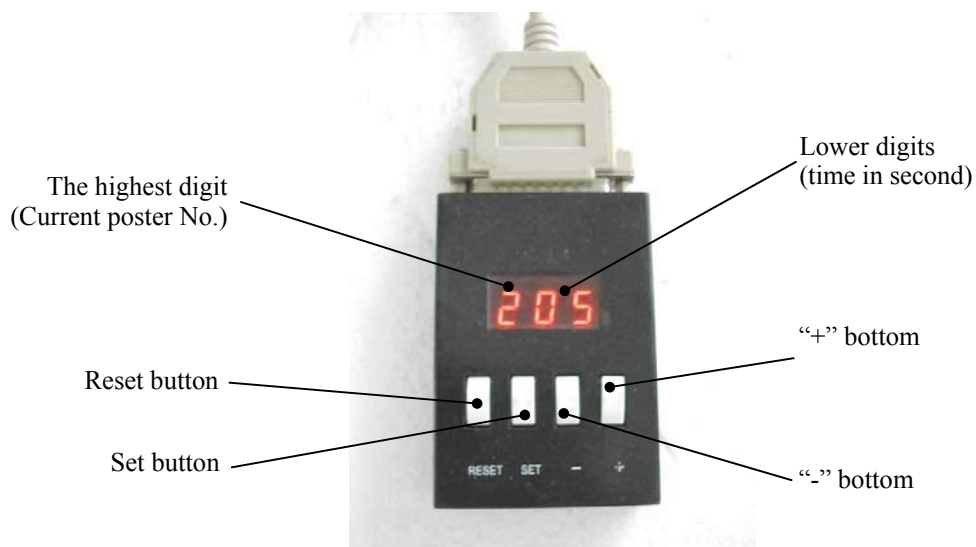


Fig. 4

1. Monitoring the system status

While the system is working normally, the display on the programmer is as follows:

The highest digit	The two lower digits
Index number of the current poster	Display time of the current poster in second
$\begin{array}{c} \longrightarrow \\ 1, 2, 3, \dots n \\ \longleftarrow \end{array}$ <p>(n: total number of posters in the scroll)</p>	$01, 02, 03, \dots T$ <p>(T: preset display time in second for the current poster)</p>
Notes: <ul style="list-style-type: none"> – “ddd” is displayed briefly when the system is powered on or reset; – The index number might no be shown in the first cycle after power-on or reset; – When a system is working as a ‘slave’ in a synchronisation set-up, there’s no display on the highest digit. The index number of the current poster will be shown on the lowest digit and middle digit shows the transition status. 	

When a system has encountered error, the programmer might display one of the following:

Display	Diagnosis
“EEE”	The system has halted possibly because of some electrical interference. While pressing the [Reset] button can usually restore normal working order, persistent “EEE” indicates serious system malfunction and that repair service is required.
“ E - - ”	Problem with the upper sensor or the related circuitry.
“ - E - ”	Problem with the poster position sensor or the related circuitry
“ - - E ”	Problem with the lower sensor or the related circuitry.

All these errors require immediate repair service.

2. Display timing set-up

Entering set-up mode

To enter set-up mode, hold down the [+] and [-] buttons, hit [Reset] button, then release the held buttons. When the programmer shows “SSS” briefly then “ _ X X ” (_ is a blank digit and XX represents any value between 00 to 30), the system is in set-up mode.

Note that it's important to release the [Reset] button before releasing the other two).

Global timing

When the highest digit is blank, the other two digits show the global display time setting that applies to all posters. The setting can be changed to 1 to 30 seconds by using the [+] or [-] buttons. Once the desired display time is set, hit the [Set] button and the programmer should show “HHH” briefly and the system will be back into normal mode. “HHH” indicates that the settings are being saved.

Individual timing

If different display timings are desired for different posters, bypass the global setting by setting its value to 0, then hitting the [Set] button once. When the programmer shows “1XX”, the system is ready to accept timing settings for each individual poster. In this mode, the highest digit of the display shows the index number of the poster and lower two digits show the timing setting value in second for the current poster. Using the [+] or [-] button can increase or decrease the setting between 1 to 30 seconds. Once the value of a picture is set, hit the [Set] button once to move on to the next poster until the max number is reached. Hit [Set] button again to save the settings and set the system back into normal mode. The index number will go from ‘1’ to ‘F’ (hex numbers for 1 to 15) regardless of how many posters are actually installed.

Default/factory settings are all 5 seconds.

To discard the changes, simply hit [Reset] any time.

3. Manual scrolling mode

a. Entering manual scrolling mode

To enter manual scrolling mode, hold down the [Set] and [-] buttons, hit [Reset] button, then release the held buttons. The display should then immediately show “ - - - ” indicating that the system is in manual scrolling mode.

b. Manual Scrolling

In manual scrolling mode, press [+] button for upward (or leftward) scrolling, [-] for downward (or rightward) scrolling. Scrolling should stop as soon as the button is released.

c. Exit manual scrolling mode

Simply press [Reset] button to restart the system into normal mode.

IV. Safety Issues

1. Installation

Scrolling Poster Display System may be installed in various ways, e.g. wall mounted, hanging, stand, free stand, etc. Please specify intended installation method when placing purchase order. Whichever method is to be used, the structure, e.g. wall, ceiling, stand, etc., on which the system is installed must have sufficient strength for the weight of the system

2. Electrical safety

Each system should use a separate power point with isolation switch. The power source should be properly earthed and fitted with safety switch. The capacity of the power source must be great than the power consumption of the system.

3. Operational safety

System intended for outdoor use must be stated so in purchase order.

Always install the system in a place that provides adequate room for ventilation and maintenance.

Do not install the system near any heat source.

V. Preparing Posters

Choosing poster material for Scrolling Poster Display System is rather flexible. It is recommended to use ordinary back lit film but many other types are also workable. Users may experiment themselves. Unless specified otherwise by the documentation shipped with some custom designed systems, the poster size and layout can be calculated according to appendix A.

Production of posters includes the following steps:

1. Adjust the size and proportion of the artwork so that they fit the viewing windows properly.
2. Extra large image can be tiled by multiple prints in the scrolling direction. The joints must be flat and smooth and free of wrinkles.

Important: tile only along the scrolling direction, i.e. the joints must be parallel to the rollers.

3. After printing, cut and trim the poster to the correct size. Make sure the poster is rectangular.
4. Adhere position stickers on the poster according to the drawings of *Appendix A*. (if the poster is not to be laminated or already laminated, adhere a larger clear tape on top to protect the position sticker).

Important: the size and position of the stickers must be in accordance with appendix A or the system may not work properly.

5. To avoid unbalance tension caused by the thickness of the position stickers, adhere clear tape of the same size on the opposing side of the poster.
6. Laminate the finished poster.

VI. Loading Poster

Take the following steps below to load poster:

1. Disconnect the power supply and open the front cover.
Important: Always use necessary means to brace the front cover firmly and securely. Front cover hinged on top must be restrained from sliding sideways or the hinges may disengage. Failing to do these could cause severe injuries and damages.
2. Unwind and remove the existing poster.
3. Scroll up the new poster first; then use sticky tape to attach its upper/LHS to the upper/LHS roller. Make sure the scroll is positioned centred and parallel to the roller.
4. Power on the system with the external programmer plugged in; and enter 'manual scrolling mode'. (refer to Section III)
5. Slowly wind the poster onto the roller by using the [+] or [-] buttons on the external programmer. While doing this, make sure the poster is smooth, tight and free of wrinkle. The poster should stay centred to the roller. Spiralling off toward one side indicates that the poster scroll has not been attached to the roller accurately and need to be unwound and attached again.
6. Once the new poster is completely wound up to the upper/LHS roller, turn off the power and pull the loose end of the poster manually to the opposite roller and attach to it using sticky tape.
7. Neaten the poster and make sure it goes through all poster guides properly.
8. Turn and power back on and enter manual scrolling mode again; drive the poster forth and back a few cycles to make sure posters are scrolling smoothly with balanced tension and without wrinkling before setting the system into 'normal mode'. Repeat previous steps if necessary.

VII. Maintenance

After a Scrolling Poster Display System is installed, regular inspection and maintenance are recommended to ensure the reliability and life span. Such inspection and service should cover the following areas:

1. Mechanical: Check the bearings, bearing holders, belt and motor holders for wear and tear and loose parts.
Grease the bearings and adjust the belt tension if necessary.
2. Poster: Check the poster including the position stickers for wear and tear and damage. Make sure the tension of the poster is well balanced and the position stickers are intact. The poster should go through all poster guides(sensor holders) properly.
Adjust or repair damage if necessary.
3. Electronic: check the main PCB, transformer sensors and wiring for damage and overheating.
Replace faulty part(s)
4. Motors: check for overheating and abnormal noise.
5. Lighting: replace the faulty or aged light tubes. Check the ballast and wirings for damage and

overheating. Replace faulty part(s).

VIII. Trouble Shooting

Before carrying out trouble shooting, always plug in the external programmer and check the system status first.

Symptom	Possible Cause	Remedy
No light, and no poster movement	No power	Check and make sure the power supply is correctly connected.
Lights on, but no poster movement, and no display on the external programmer	Blown fuse(s)	Check both the fuses before the power transformer and on the PCB, replace the faulty one(s) with same type.
Lights on, but no poster movement, and the display on the external programmer shows 'EEE'	Controller circuit malfunction	Reset the system by pressing the [Reset] button on the programmer. Or turn off the power; wait for a few seconds then turn it back on.
	Problem of motor(s) or the related circuitry	Use manual scrolling mode to find out which roller is not rotating and then identify the problematic motor, check its wirings and synchronous belt, too. Replace the faulty part(s).
Poster moves only briefly then stops and the programmer shows "E - -" or "- E -" or "- - E"	Problem of position sensor(s) or related circuitry	Check the corresponding sticker and sensor. When power is on, sensor can be checked by using a screwdriver (or any small piece of metal). The LED indicator at the back of the sensor should come on when the screwdriver is placed near the front of the sensor, and go off when the screwdriver is moved away, or the sensor or its related circuitry is faulty.
Certain poster(s) don't stop	Position sticker	Check the position sticker on the problematic poster for damage or shifting. Replace the sticker if necessary.
Poster fails to reverse, it overruns to one end and stops with "EEE" displayed on the programmer	Faulty end sticker or end sensor or the related circuitry	Check the sensor and the sticker for malfunction or damage. Normally when the end of a scroll is reached, the end sensor and position sensor should get to the end stickers at the same time.
The tension of the poster is unbalance	Poster(s) distorted	Check the poster scroll and correct the problem. Refer to the 'Preparing Posters' section for details.
Poster movement stops at either end of the scroll, the programmer shows 'EEE'	Problem of motor(s) or the related circuitry	Use manual scrolling mode to find out which roller is not rotating and then identify the problematic motor, check its wirings and synchronous belt. Replace the faulty part(s).

Should the problem persist or other problem be detected, contact our service department for assistance.

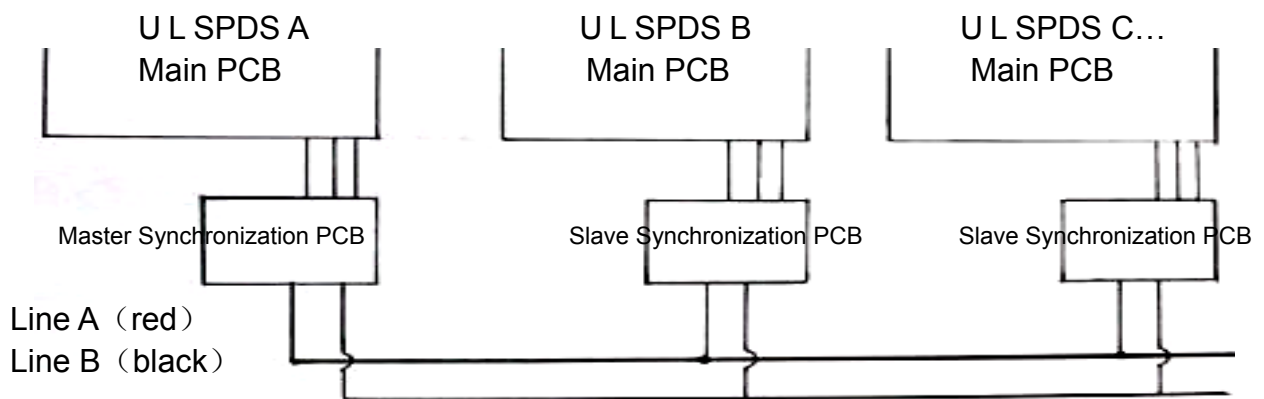
Synchronization Instruction

A. Preconditions of ULSPDS of Synchronization:

1. Similar size, same number of images(posters)
2. Main PCB with support synchronization function.
(C series for example, 51C)
3. Additional Synchronization PCB. (version: SPD-COM)
4. Correct link between SPDS.

B. Work principle of Synchronization:

We choose one of the ULSPDS as the master. Others will be slaves. When the master runs, and gives order to the slaves to start scrolling at the same time to achieve SYNCHRONIZATION.



c. Setting of Synchronization PCB

Before to using Synchronization PCB, we need to setup it. We can set one as Master synchronization PCB (Fig.1). Others set as Slave Synchronization PCB. (Fig. 2)

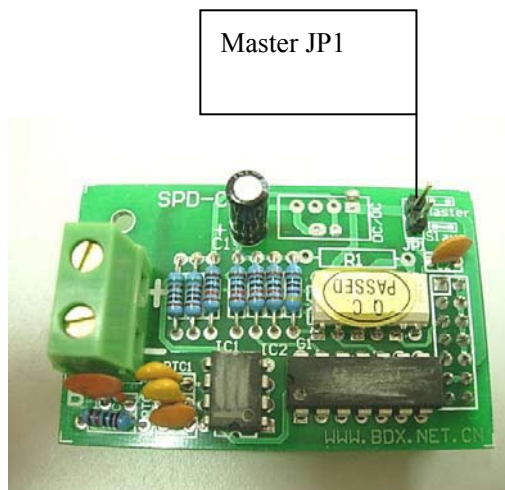


Fig.1

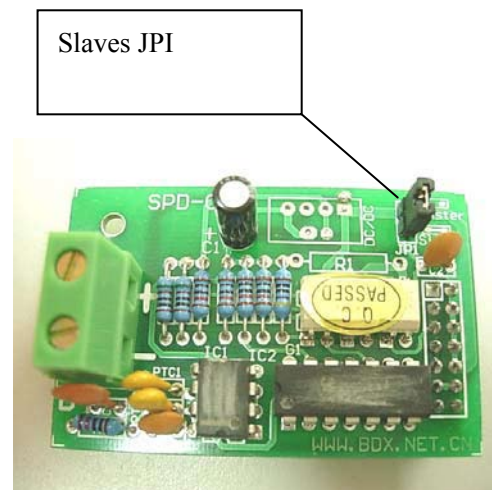


Fig.2

D. Synchronization Step by Step

1. Decide which ULSPDS will be the master. Put master synchronization PCB on it, as well as slaves.
2. Fix the screw on the PCB.(Fig. 3)
3. Plug the Synchronization PCB on CNI (14P) of the main PCB. (Fig.4)
4. Use M3 screw fix the Synchronization PCB.

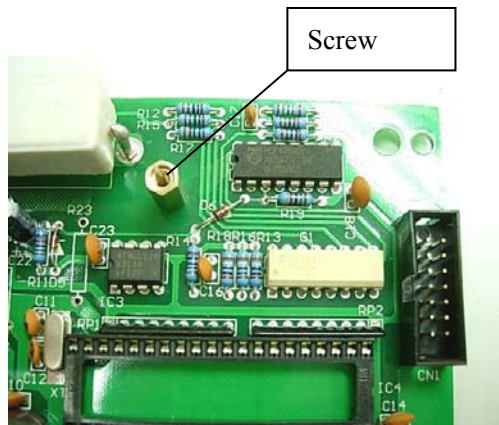


Fig.3

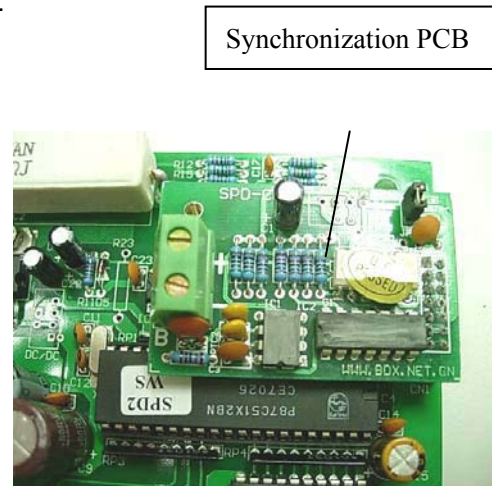


Fig.4

5. Connection as Fig. 5

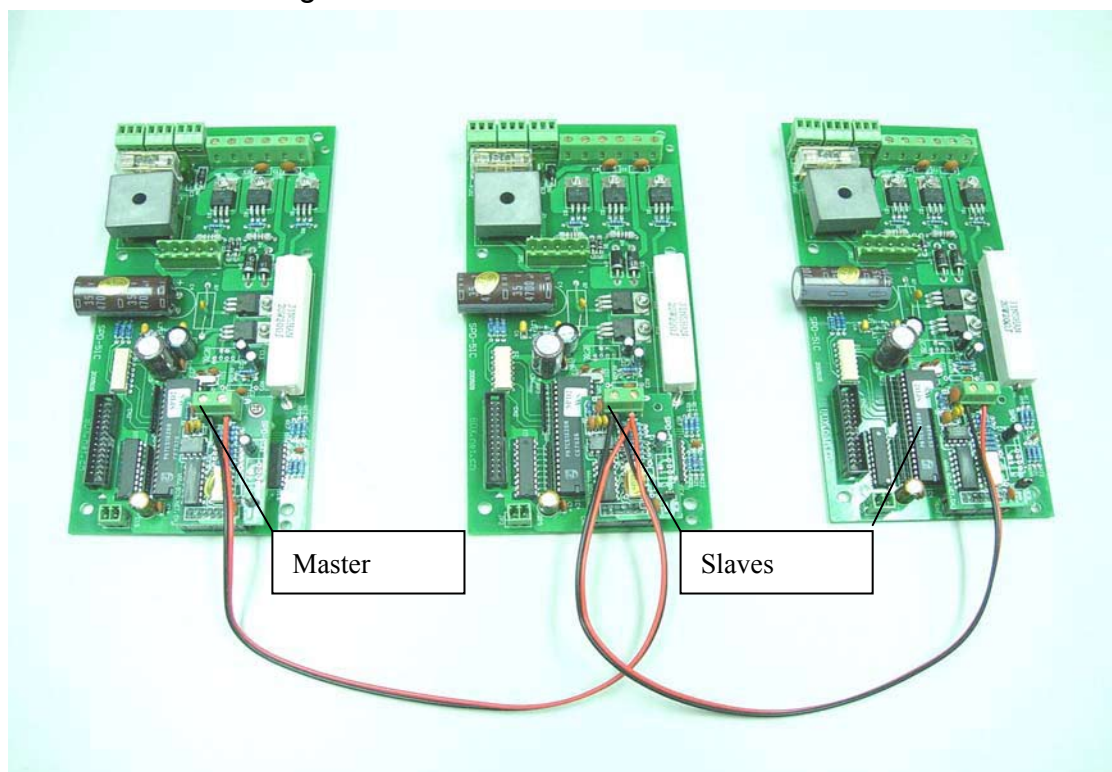


Fig. 5

E. Remarks

- a.) The master can work independently; the slaves can not.

- b.) We can only setup one master. Otherwise all the slaves can not work normally.
- c.) If the master can not work normally, all the slaves will be waiting for order.
- b.) If one of the slaves can not work, it will not influence others.
Without the Synchronization PCB, they can work independently.
- d.) We need to wait a few seconds before Synchronization due to different position of poster of each ULSPDS.

Operation Guide

1. Initialisation

If a timer switch is brand new or has been left unused for a long time, and there is no display on the LCD panel when connected to main power, it needs to be initialised.

To initialise a timer switch, press the reset button in the hole in the lower left corner using a small-tipped tool five minutes after the timer switch is connected to the main power.

2. Switching between time display modes

By default, the time display on the timer switch is in 24 hour mode. To switch the display mode between 24 hour mode and 12 hour mode, press and hold down the [Clock] button for five (5) seconds. AM/PM indicator will show in 12 hour mode and disappear for 24 hour mode.

3. Program the timer switch

Step	Operation	Descriptions
1	Press the [Set] button	Select the first “on” of the first channel
2	Press the [Hour] and/or the [Minute] buttons	Set the time of the first “on” of the first channel
3	Press the [Week] button	Set the day of the first “on” of the first channel. Skip this step for daily recurrence.
4	Press the [Set] button	Select the first “off” of the first channel
5	Press the [Hour] and/or the [Minute] buttons	Set the time of the first “off” of the first channel
6	Press the [Week] button	Set the day of the first “off” of the first channel. Skip this step for daily recurrence.
7	Repeat 1-6	Program the time and day of the three succeeding “on” and “off” of the first channel.
8	Repeat 1-7	Program the second channel.

Press the [Set] button to skip setting. “--:--” on the LCD display means no setting is made. To cancel the change to a setting and restore the original, press the [OR1] or [OR2] button twice.

4. Set up the clock

4.1 Hold down the [clock] button and press the [Week] button to set the day.

SU	MO	TU	WE	TH	FR	SA
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

4.2 Hold down the [Clock] button and press the [Hour] and [Minute] buttons respectively to set the time.

5. Set the operation mode

After the switch actions are programmed and the clock set, use the [On/Auto/Off] button to select the desired operation mode.

Display	Operation mode
ON AT	Currently on; Program enabled
AT OFF	Currently off; Program enabled
ON	On; Program disabled
OFF	Off; Program disabled

The number of current channel, [1] or [2] is shown on the LCD display. When the program is enabled, Please make sure that the mode selected matches the programmed status for that time.

6. Checking and changing the program settings

To go check the program settings, press the [Set] button. To change the displayed program setting, press the [OR1] or [OR2] button and set the new day and time. Press the [Clock] button to exit and reinstate time display.

7. Overriding the program

Press the [OR1] or [OR2] button anytime to override the program.

Important

- The time and date of the switch actions must be in sequence.
- Do not use the product in dusty area, direct sunlight, rain or corrosive environment.
- Only store/use the product only in specified voltage, temperature, humidity range.

DHC16-2a Two-Channel Programmable Timer Switch

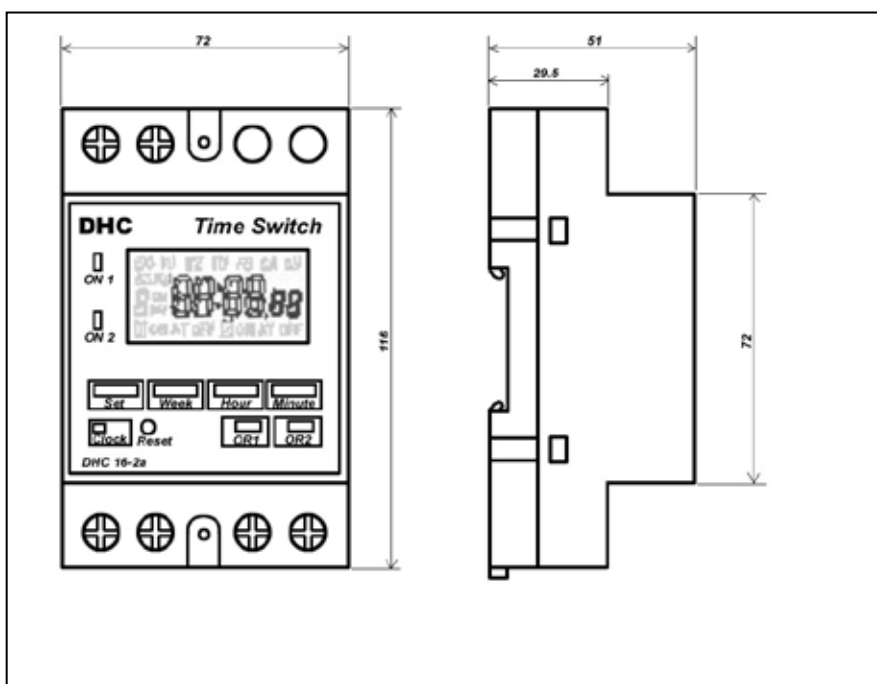
Features

- Specially designed for industrial applications, DIN 35mm rail mounted
- Two independent channels, 4 on and 4 off settings per channel, daily or weekly recurrence, manual overriding
- Large LCD display
- Built-in battery for continued operation without main power
- High timing accuracy of $\pm 62s$ per day

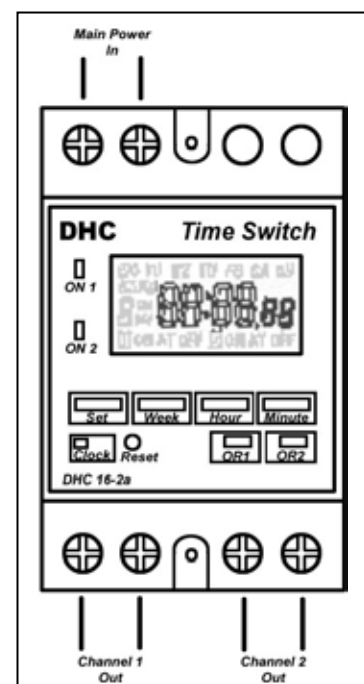
Specifications

Voltage: 180VAC – 250VAC, 50/60Hz	Timing accuracy: $\pm 62s$ per day
Maximum number of program settings: 4 on and 4 off per channel	Minimum On/Off interval: 1 minute
Contactors: Two ways per channel, normal open	Weight: approximately 275g
Power consumption: $\approx 4VA$	Operating temperature: -108C to 408C
Maximum switch current: 25A (250VAC, resistance loading) or 2.5A (250VAC, inductive loading)	Operating humidity: 30% - 85% RH
User setting volatility: /15 days (after 48 hours of continuous connection to main power)	Electrical lifespan: 10^5 times of switching (full load)
Display: LCD	Mechanical lifespan: 10^7 times of switching

Dimensions



Wiring



Wireless Synchronisation Module (WLSM)

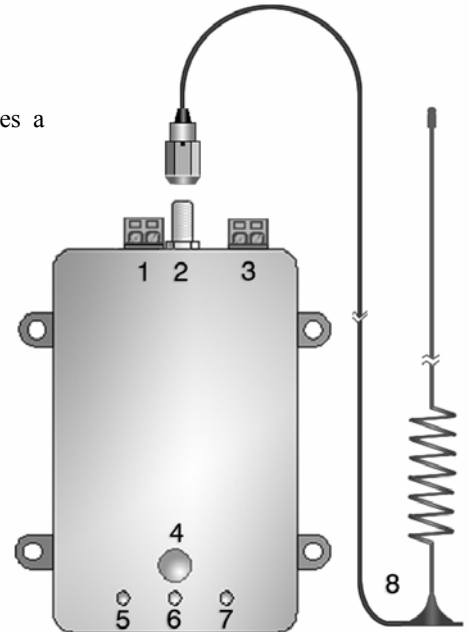
January 2007

Introduction

Wireless Synchronisation Module (WLSM) is an extension of the synchronisation function on eShow signs, such as Scrolling Poster Display System (ULSPDS) and Scrolling Poster Display Engine (ULSPDE). It enables a number of signs to operate in a coordinated manner without having to physically interconnecting them together.

A WLSM consists of a small black box and an antenna. As shown in the picture, the main parts of a WLSM include:

1. Communication port (RS485)
2. SMA™ Antenna socket
3. Power connector (12V DC)
4. Mode switch (up for master; down for slave)
5. Status indicator (flashing during reception and transmission)
6. Mode indicator (on for master; off for slave)
7. Power indicator
8. Antenna with cable and SMA™ plug

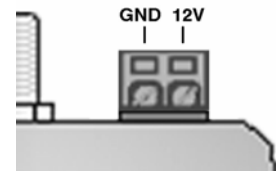


Installation in 5 simple steps

1. Fix the WLSM box

WLSM is small and light enough to be fitted inside any eShow sign. It is recommended to be fixed near the main controller unit with screws, tapes or ties.

2. **Connect the power.** The 12V DC power supply required by WLSM can be drawn from the power connector or sensor connector on the main controller unit or other module of the eShow sign.

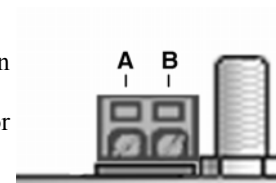


3. Install the antenna

In most situations, the antenna can be installed inside the eShow sign. The antenna has a magnetic base and is fitted with a cable and a SMA™ plug. Simply screw the SMA™ plug to the socket on the WLSM box, and place the antenna at a suitable position.

4. Connect the communication ports

In a “master” unit, the WLSM should be connected to the “out port” of the eShow sign main controller; in a “slave” unit, the WLSM should be connected to the “in port” on the eShow sign main controller. The connection should be made with a twisted pair or similar cable that is compliant with RS485 standard. Please make sure the polarity of the connection is correct.



5. Set the appropriate mode

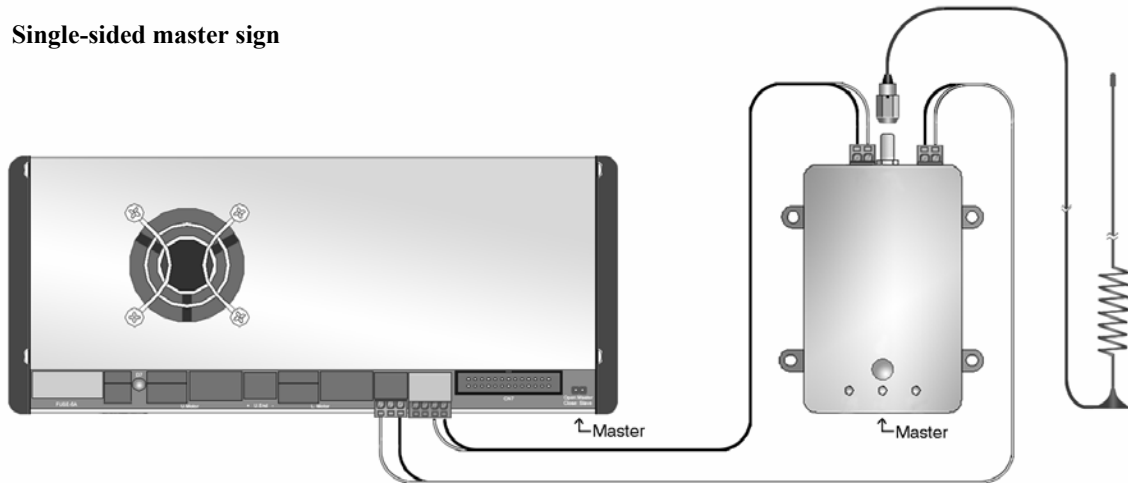
When the mode switch is up, the mode indicator is on and the WLSM is set to “master” mode, in which synchronisation signals are received from the eShow sign main controller and relayed to “slave” unit(s) by radio transmission.

When the mode switch is down, the mode indicator is off and the WLSM is set to “slave” mode, in which synchronisation signals are received from radio transmission and relayed to the eShow sign main controller(s) via a cable.

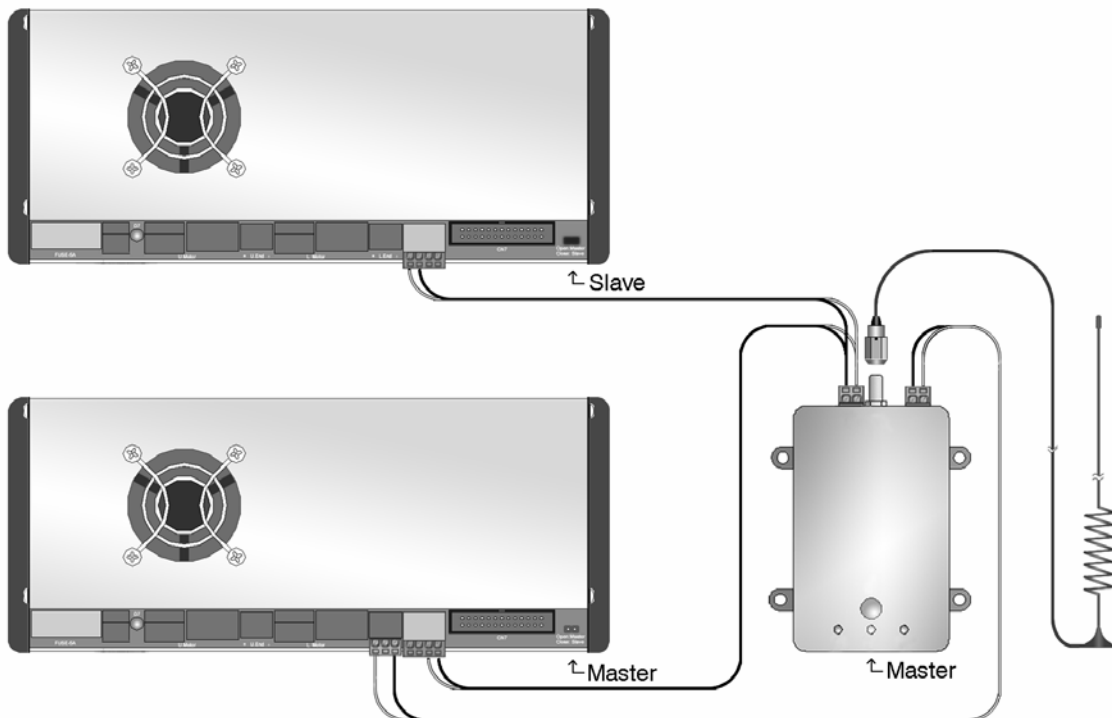
Typical configurations

The following diagrams illustrate the wirings of WLSM in a number of typical situations. ULSPDE main controller is used for example.

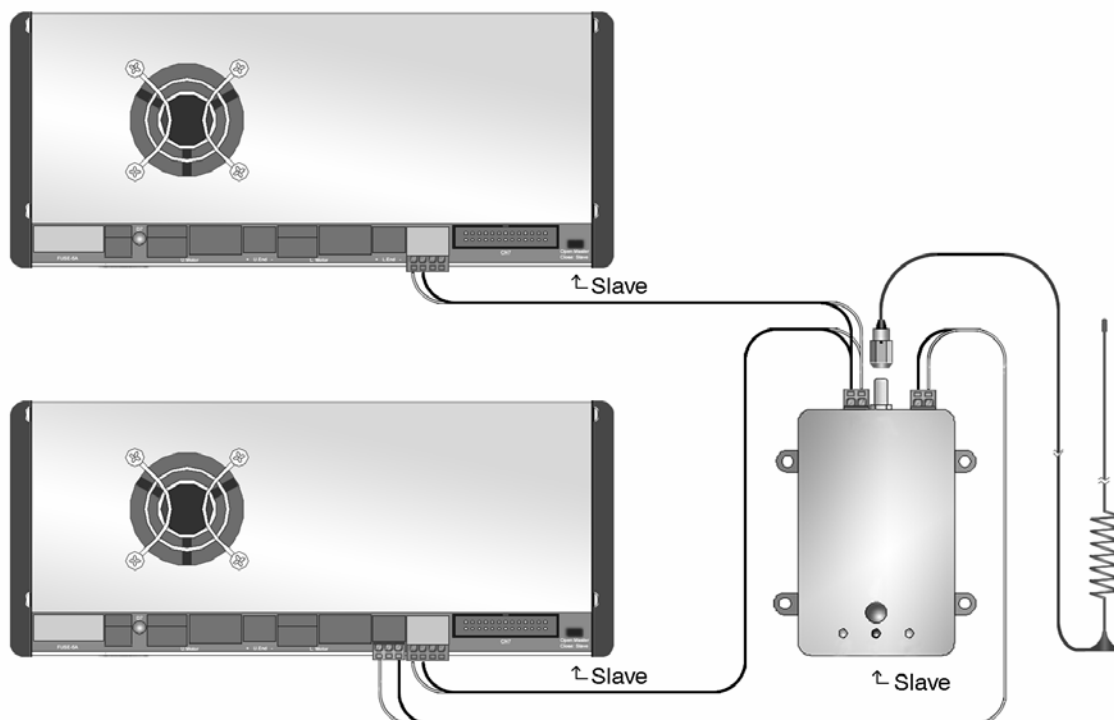
1. Single-sided master sign



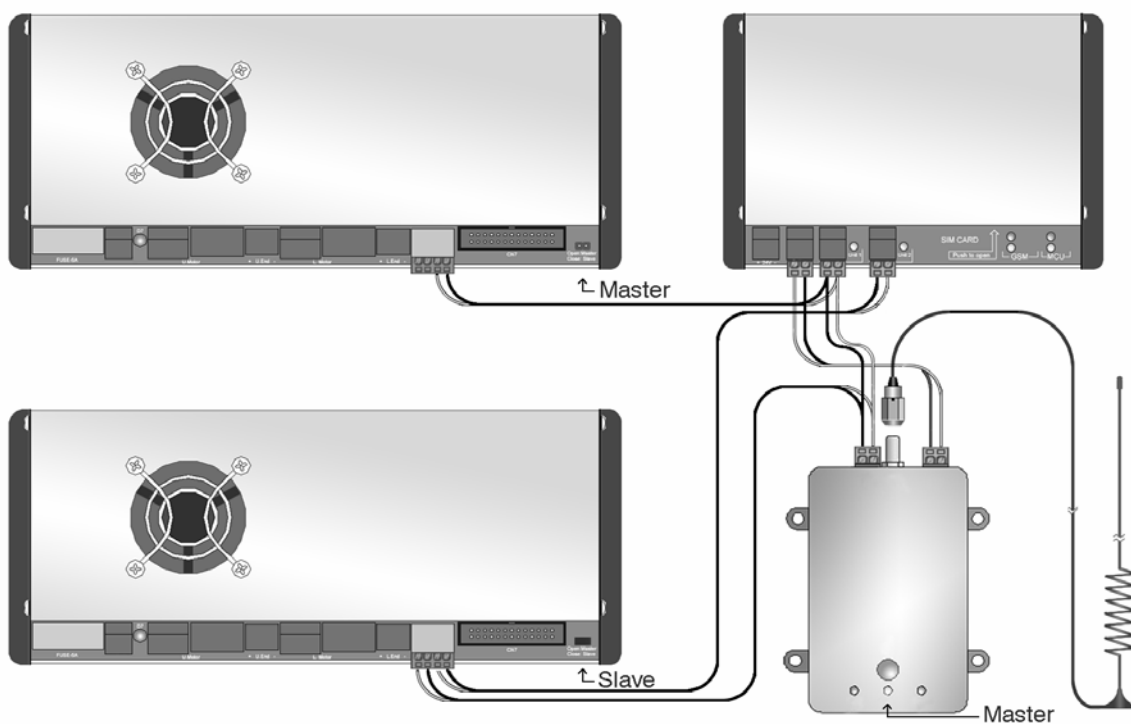
2. Double sided master sign



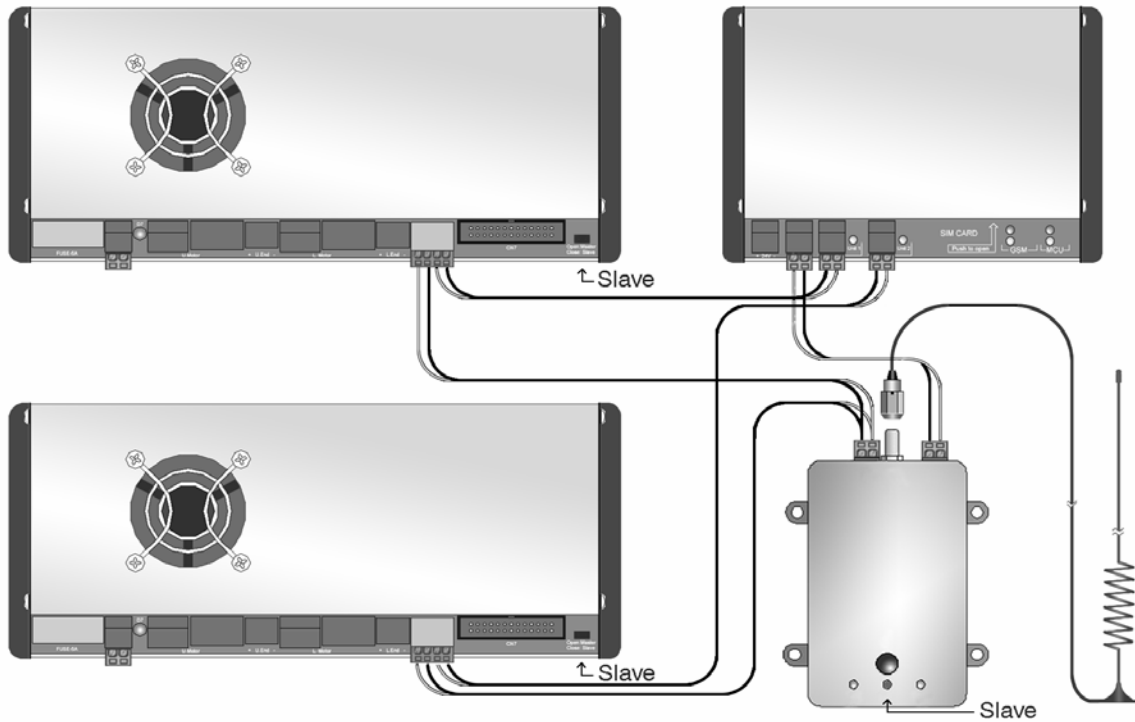
3. Double sided slave sign



4. Double sided master sign with GSM monitor



5. Double-sided slave sign with GSM monitor



Specifications

Power supply: 12V DC, <50mA

Communication port: RS485

Radio frequency: 433MHz - 434 MHz

Transmission power: 50mW

Receiver Sensitivity: -115dBm

Modulation: GFSK

Protocol: Proprietary BDX Sign Control Protocol